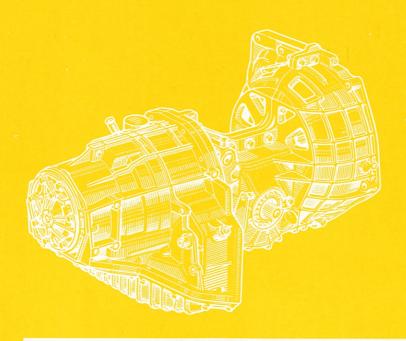
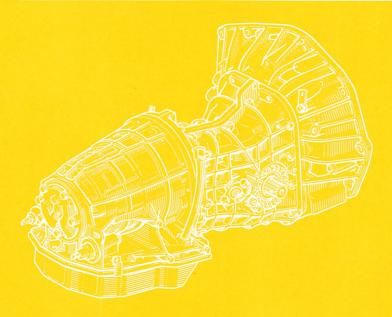
M.R. 215

77 01 446 302 ♦ **⑤ Édition Anglaise**





RENAULT

RENAUIII

10005 11/3/5

Workshop manual

M.R. 215

automatic transmissions types: 4139-4141

This Manual cancels and supersedes all information concerning checking and adjusting values and repair methods which have been published earlier in other Workshop Manuals or I.S. Notes for the vehicles concerned.

Type 4139

Type 4141

December 1979

Édition Anglaise

77 01 446 302

♦ ● F.A.D.Dk.E.It.N.NL.S.

"The repair methods given by the manufacturer in this manual are based on the technical specifications current when it is compiled.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed"

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Special tools

Fill in and send to your After-Sales Head Office MR 215

REMARKS AND SUGG	EESTIONS
concerning:	
• Methods described	
• Explicitness of test	
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Clearness of illustrations	
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However, we will be grateful to you for any suggestions for improvement. Please cut out this sheet, enter any remarks or suggestions which might

be useful and forward it to us via your After-Sales Head Office.



accurate as possible.

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AUTOMATIC TRANSMISSION Type 4139

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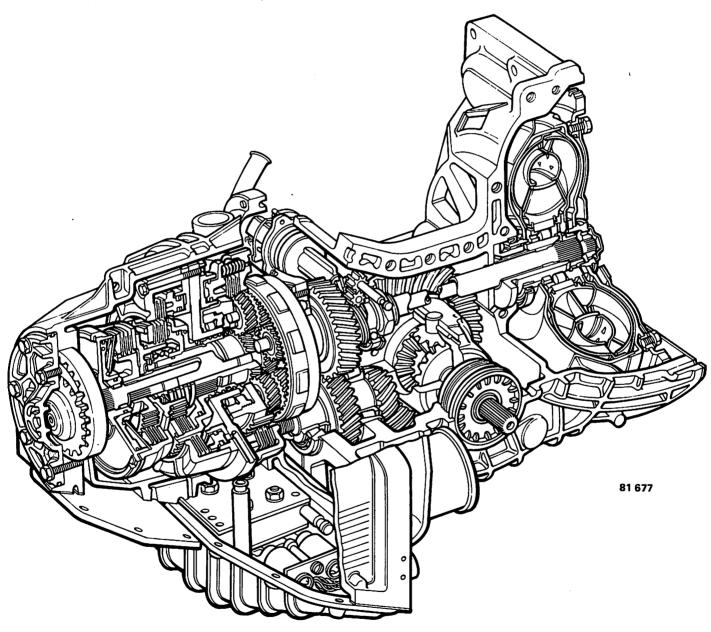
SPECIFICATION

Sectional view



AUTOMATIC TRANSMISSION TYPE 4139

The transmission shown here is the 4139-23



Identification



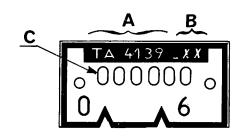
4139

The identification plate is stamped with the following data:

- at A : automatic transmission type
- at B : type suffixat C : fabrication No.

REMINDER

The engine, its ignition system and carburation and their settings also certain mechanical features in the vehicle differ depending on whether a manual gearbox or automatic transmission is fitted.



74 513.B

Auto-	 Vehicle	Stee	ring	Final	Step-down	Speedo	Special points
suffix		R.H.	L.H.	drive	cluster	drive	
00	R1153		Х	9 x 34	37 x 38	12 x 17	Long shafts (oil pump and turbine)
02	R1153	x		9 x 34	37 x 38	12 x 17	Long shafts (oil pump
03	R1153	x		9 x 34	37 x 38	12 x 17	and turbine)
04	R1153		x	9 x 34	37 x 38	12 x 17	
	R1155		×	9 x 34	37 x 38	12 x 17	
05	R1153	×		9 x 34	37 x 38	12 x 17	
06	R1155		X	9 x 34	37 x 38	12 x 17	
07	R1153	×		9 x 34	37 x 38	12 x 17	
80	R1155	i	x	9 x 34	37 x 38	12 x 17	
10	R1154	×	x	9 x 34	37 x 38	12 x 17	Long shafts (oil pump
11	R1154	×		9 x 34	37 x 38	12 x 17	and turbine) Long shafts (oil pump
12	R1156	:	×	9 x 32	37 x 39	12 x 16	and turbine)
13	R1156	×		9 x 32	37 x 39	12 x 16	
14	R1154		x	9 x 34	37 x 38	12 x 17	·
15	R1154	X.		9 x 34	37 x 38	12 x 17	
18	R1156		х	9 x 32	37 x 39	12 x 16	
19	R1156	X		9 x 32	37 x 39	12 x 16	
23	R1341	×	×	9 x 32	37 x 38	9 x 20	
	R1351	×	×	9 x 32	37 x 38	9 x 20	
•	ı	I I		l	I	I	I

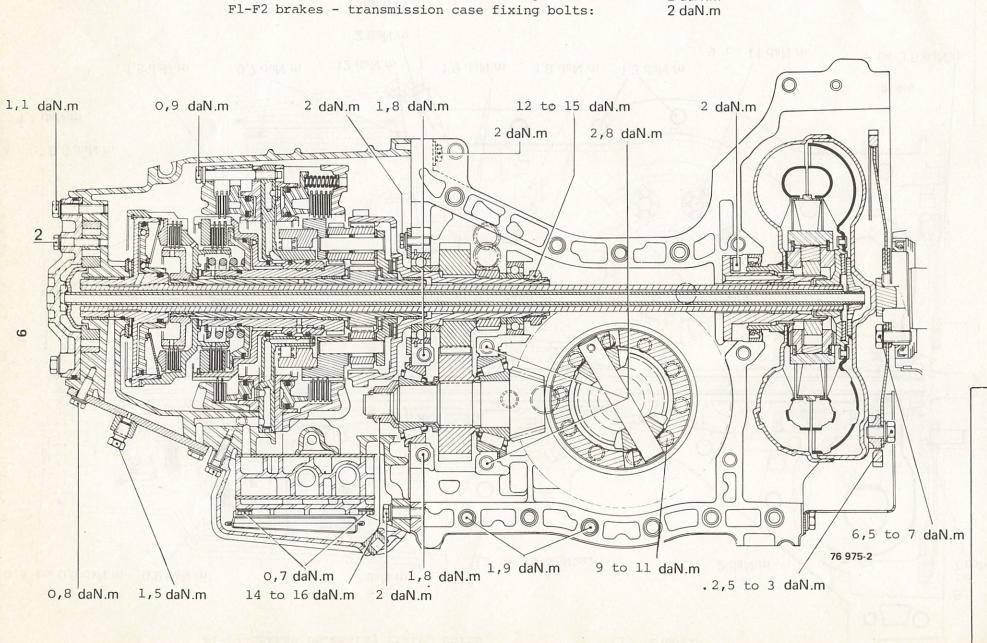


SPECIFICATION

Identification



									4139
	Auto- trans. suffix	Vehicle	Steen	L.H.	Final drive	Step-down cluster	Speedo drive	Specia	l points
	25	R1318	X	2	9 x 32	37 x 38	12 x 17		
		R1328	×		9 x 32	37 x 38	12 x 17		
	30	R1302		х	9 x 32	37 x 38	12 x 17	Long sha	fts (oil pump ine)
	•	R1312		x	9 x 32	37 x 38	12 x 17	Long sha and turb	fts (oil pump ine)
		R1322		х	9 x 32	37 x 38	12 x 17	Long sha and turb	fts (oil pump ine)
Ŋ	31	R1177	×	x	9 x 32	35 x 39	12 x 19		
_	,	R1300	×	x	9 x 32	35 x 39	12 x 19		
3	32	R1302	×	i !	9 x 32	37 x 38	12 x 17		
9		R1312	×		9 x 32	37 x 38	12 x 17		
		R1318	×		9 x 32	37 x 38	12 x 17		
		R1322	×		9 x 32	37 x 38	12 x 17		
		R1328	×		9 x 32	37 x 38	12 x 17		
_	33	R1302		x	9 x 32	37 x 38	12 x 17		
	•	R1312		x	9 x 32	37 x 38	12 x 17		
		R1318		x	9 x 32	37 x 38	12 x 17		
		R1322		x	9 x 32	37 x 38	12 x 17		
		R1328		x	9 x 32	37 x 38	12 x 17		
	34	R1177		x	9 x 32	35 x 39	12 x 19		
		R1179	:	x	9 x 32	35 x 39	12 x 19		
		R1300		x	9 x 32	35 x 39	12 x 19		
		R1337		x	9 x 32	35 x 39	12 x 19		
	35	R1177	×		9 x 32	35 x 39	12 x 19		
	•	R1300	×		9 x 32	35 x 39	12 x 19		
		R1337	×		9 x 32	35 x 39	12 x 19		
	36	R1177		×	9 x 32	35 x 39	12 x 19		
		R1300		×	9 x 32	35 x 39	12 x 19		
		R1337		x	9 x 32	35 x 39	· 12 x 19		
	40	R1225	×	x	9 x 32	35 x 34	12 x 17	Capsule	not connected
	41	R1225	. x	x	9 x 32	35 x 34	12 x 17	Less ca	psule
	50	R1340	l x	l _X	9 x 32	34 x 37	9 x 21		
						•			



- freewheel carrier fixing bolts:

Fl brake

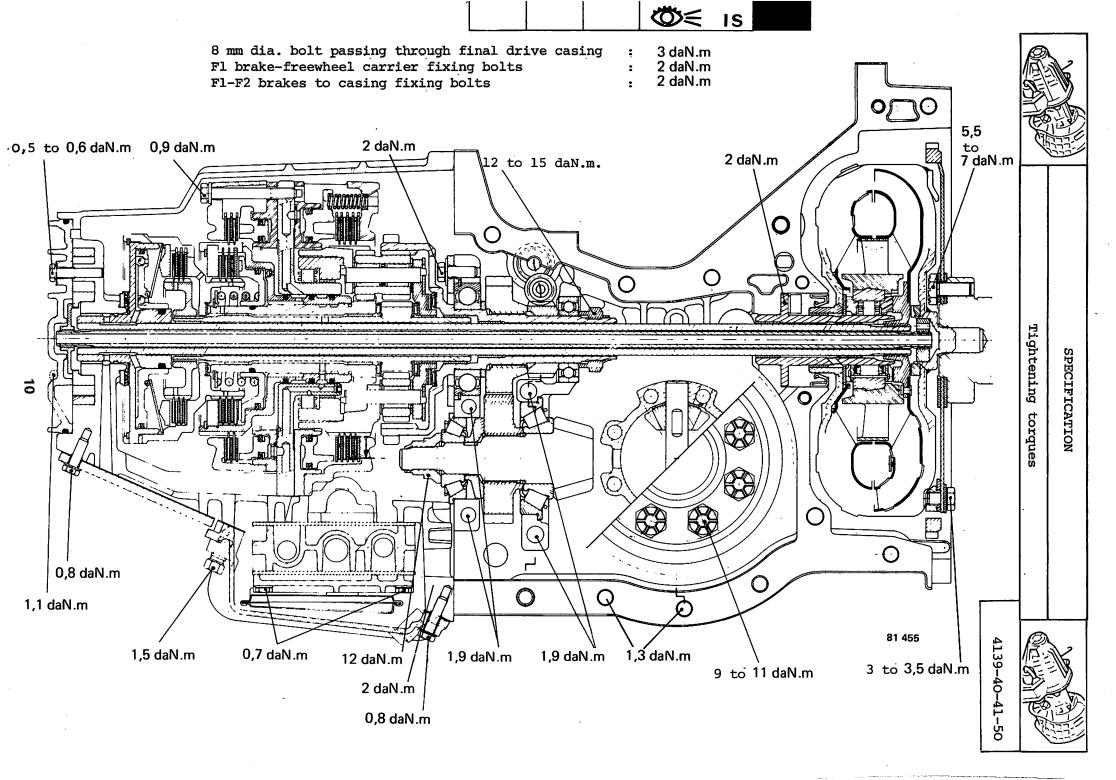


SPECIFICATION

Tightening torques



2 daN.m





Gear changing speeds



4139

All type: 4139 except R.1156 - R.1318 - R.1328

Foot	Gear changing speeds (in km/h)						
position	1 →	→ 2	2 3				
	~	_	~	1			
Light throttle (PL)		13(8)		23 (14)			
Full throttle (PF)	58 (36)		99 (61 <u>)</u>				
Kick-down (RC)	61 (38)		102 (64)				

(Miles per hour in brackets)

R. 1156 - R. 1318 - R. 1328

Foot	Gear changing speeds (in km/h)						
position	1-	- 2	23				
	~		_	_			
Light throttle (PL)		14(8½)		24 (15)			
Full throttle (PF)	64 (40)	·	110(68)				
Kick-down (RC)	67 (41½)		113 (70)				

(Miles per hour in brackets)

Gear changing speeds

The figures shown in the above tables give the average theoretical speeds for gear changing (stopwatch timed speeds).

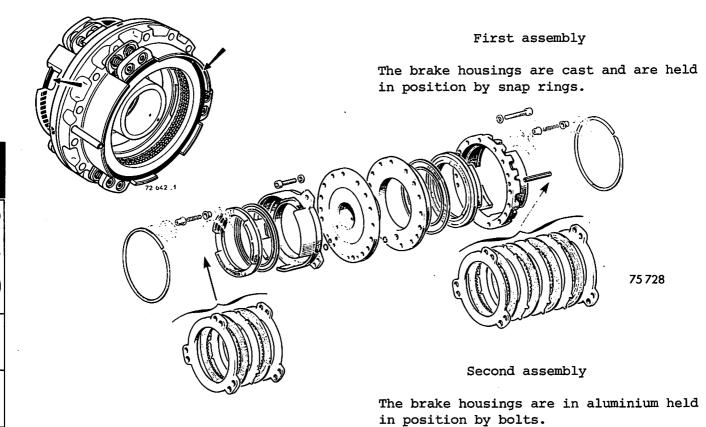
They may vary depending on the tolerances in the units (governor, computer, speedometer) also on the type of tyre fitted.

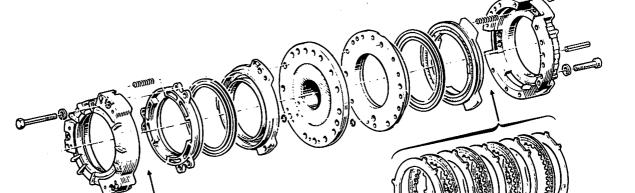
Special features



Fl and F2 BRAKES

4139





77055

B.Vi. 489-05

The location of the Fl and F2 brake assemblies on the freewheel bearing used to be made by positioning studs B.Vi.489-O5 in the special calibrated holes.

Use mandrels B.Vi.564 as these holes are now discontinued.







Special features



TURBINE SHAFT

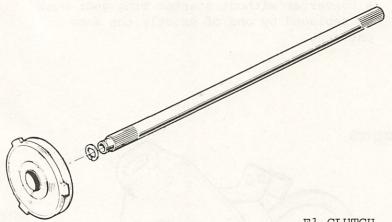
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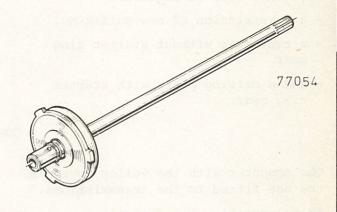
First assembly

The turbine shaft is fixed to the El bellhousing by a circlip.

Second assembly

The turbine shaft is integral with the El bellhousing and cannot be dismantled.





El CLUTCH

The El clutch piston has 2 release holes to give more rapid pressure release.

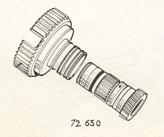
P2 SUNWHEEL

The P2 sunwheel is press-fitted to the E2 clutch bellhousing. The assembly cannot be dismantled.

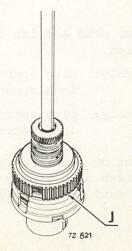
This has led to an operating clearance modification between El and E2. J = 3 to 5 mm (.118 to .197") insteadof J = 1 mm (.039").

First assembly

Second assembly







Special features



4139

CONVERTER

Complete automatic transmissions for converters with welded starter ring gear are no longer supplied by the Parts Department.

If one of the above is changed, the following will be required:

- a transmission of new suffix No.
- a converter without starter ring gear
- and a driving plate with starter ring gear.

Replacement converter

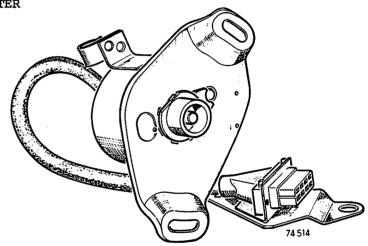
Once stocks are exhausted, the Parts Department will only supply a "Special Service" converter for early vehicles. A driving plate with starter ring gear will be required to match.

A converter without starter ring gear must be replaced by one of exactly the same pattern.

COMPUTER

The computer with the yellow cover is the one fitted to the transmissions.

It is possible when changing a mechanical components casing with the mounting for the reversing lights switch to refit the old computer provided that its outlet socket is raised using Kit Part No. 77 Ol 457 O91 provided for the purpose.



GOVERNOR

14

The governor to match the above transmissions is colour-coded red at (A).

The governor plug and its fastener have been modified.

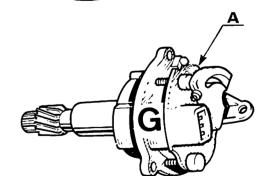
- 1st assembly: plug approximately 12 mm

long secured with 1 clip.

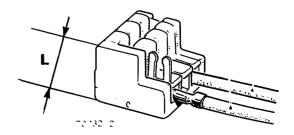
- 2nd assembly: plug approximately 23 mm

long secured with 2 clips.

In the event of a 2-clip type governor being fitted instead of a single clip type, the old short plug must be replaced by the plug 23mm long.



70 724 B





SPECIFICATION

Special features



VACUUM CAPSULE

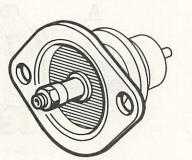
4139

One complete turn of the screw alters the pressure by:

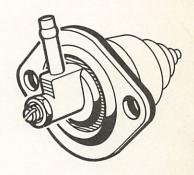
- O,l bar (l¹₂ psi) for lst. assembly capsules
- 0,2 to 0,3 bar (3 to 4½ psi) for 2nd. assembly capsules.

Note: The Parts Department only supply 2nd. assembly capsules.

1st. assembly



2nd. assembly



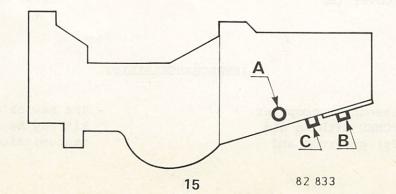
77 693

OIL PRESSURE

Vehicle type	Auto- transmission type	Pressure union	Adjustment on vehicle on road - changing up 1 > 2 (full throttle-PF) (pressure in bars)				
R.1153	4139-03	A	3,9 (55.47)				
R.1154	17	77	"				
R.1155	4139-04	8 A	3,9				
R.1156	4139-12-13	Α	4,52 (64.29)				
R.1328	4139-21-22	В	3,9				
R.1318	4139-32-33	В	4,52				
R.1300	4139-31-34	В	3,75 (53.33)				
R.1177-R.1337	4139-31-34	В	3,75				
R.1225	4139-41-40	С	3,65 (51.91)				
R.1340	4139-50	С	3,8 (54.04)				
R.1341	4139-23	Α	4 (56.89)				
R.1351	4139-23	А	4				

PRESSURE UNION

(psi in brackets)

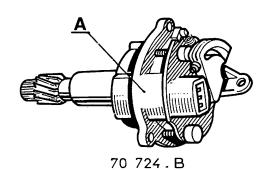


Governor - Computer



4139

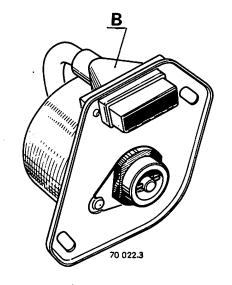
GOVERNOR



1st. assembly
Aluminium body (A).
12 V.

2nd. assembly
Plastic body (A).
6 V.

COMPUTER



1st. assembly Yellow cover (B) 12 V. 2nd. assembly
Clear cover (B)
6 V.

INTERCHANGEABILITY

 A new (2nd. assembly) computer CANNOT BE MATCHED with an old (1st. assembly) governor and vice versa. The new or old governor-computer kit may be fitted to any transmission. Oil



4139

RECOMMENDED OIL

The oil used is the same throughout the transmission (converter, mechanical components casing, final drive) :

ELF RENAULTMATIC D2 or MOBIL ATF 220

CAPACITIES

	Theoretical total	After draining
RENAULT 5	5 litres (834 Imp.pts.)	TOR XAM"
RENAULT 12/15	5 litres	fen canyii
RENAULT 17	6 litres (10½ Imp.pts.)	2,5 litres (4.4 Imp.pts.)
RENAULT 16	6 litres	then check level
RENAULT 18 (R.1340)	5 litres	
RENAULT 18 (R.1341)	6 litres	1

OIL CHANGING FREQUENCY

- During the 1st. Inspection and Checks between 1000 and 2000 km (500 and 1000 miles)
 - then every 30000 km (20000 miles).



Checking oil levels



4139

Place the vehicle on smooth level ground.

Move the selector lever to "P" (Park).

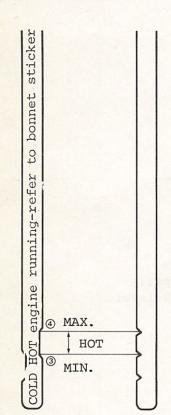
Start the engine and wait a minute or two for the converter (and oil cooler if fitted) to fill.

CHECKING HOT (after a road run of approximately half an hour)

- The oil temperature must be 80°C.
- The oil level should not be below notch (3) MIN. HOT nor above notch (4) MAX. HOT.

CHECKING COLD (immediately on starting or after an oil change)

- Oil is at ambient temperature.
- The oil level should not be below notch (1) MIN. COLD nor above notch (2) MAX. COLD.

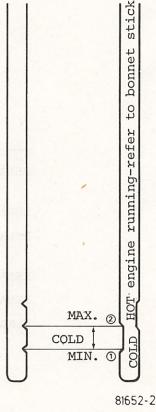


NEVER OVERFILL beyond the "MAX. COLD" and "MAX. HOT" levels.

Warning:

Excess oil leads to :

- oil overheating
- and leaks.



DRAINING - REFILLING

DRAINING

The oil must be drained while hot immediately the engine has stopped so as to dispose of all the impurities in suspension in the oil.

Proceed as follows:

- remove dipstick
- unscrew drain plug
- allow oil to drain as long as possible
- and refit drain plug.

REFILLING

Refill via the dipstick tube or top plug. Use a funnel fitted with a 15/100 mm gauze to trap any foreign matter in the oil.

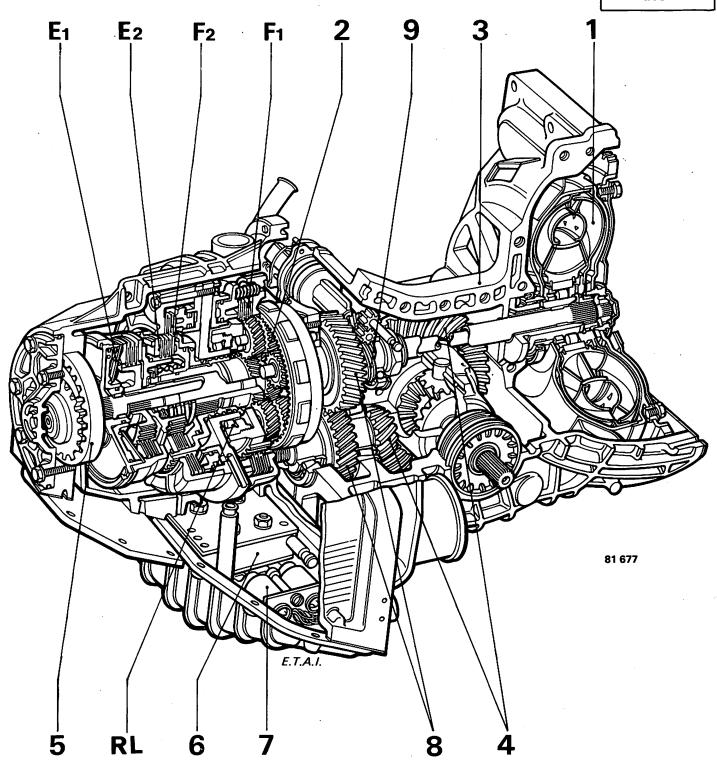
Pour in 2,5 litres (4.4 Imp. pts.) of ELF RENAULTMATIC D2 or MOBIL ATF 220 oil.

Start engine, let it idle, check the oil level and top up if required.



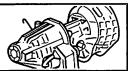
Composition





- 1 Torque converter
- 2 Epicyclic gear train and components
- 3 Differential housing
- 4 Crown wheel and pinion
- 5 Oil pump
- 6 Hydraulic distributor
- 7 Solenoid ball valves
- 8 Step-down gear cluster
- 9 Governor wheel

- El Clutch
- E2 Clutch
- Fl Brake
- F2 Brake
- RL Epicyclic gear train freewheel



Composition



4139

The automatic transmission enables the 3 forward speeds to be engaged one after the other with continuous torque action.

There are 3 main components:

- The converter,
- final drive,
- and mechanical components casing.

CONVERTER

It provides:

- a smooth coupling for transmitting engine torque to the mechanical assembly,
- automatic clutch action,
- and increased torque for moving off.

FINAL DRIVE

It transmits the drive from the mechanical assembly to the roadwheels.

It consits of:

- step-down gear cluster (8) which lowers the drive centreline,
- crown wheel and pinion (4) driving the differential housing,
- and wheel (9) which drives the governor worm.

MECHANICAL COMPONENTS CASING

It gives 3 reduction ratios for forward movement and 1 reverse.

It comprises:

- an epicyclic gear train (2),
- 3 different control elements for the above train:
- mechanical,
- hydraulic,
- and electric.

The epicyclic gear train (2)

This is an assembly of helical gears which enable different ratios to be obtained (3 forward, 1 reverse) depending on hydraulic feed to the receivers (E1 - E2 - F1 - F2).

This train consists of:

- 2 sunwheels Pl and P2,
- 3 pairs of planet wheels S1 and S2 connected by a planet wheel carrier,
- and an involute ring gear.



Electrical control units



4139

The governor and computer unit give the instructions for gearchanging. The gearchanging moments vary according to vehicle speed and engine torque.

GOVERNOR

The governor is a small low power alternator (approximately 1 Watt). It supplies computer (C) with AC current which varies according to:

- vehicle speed,
- engine lead (accelerator pedal position).

KICK-DOWN SWITCH

By being placed at the end of accelerator travel, it earths one of the computer circuits which in certain pre-determined conditions, will cause an immediate change down to a lower ratio.

SOLENOID BALL VALVES

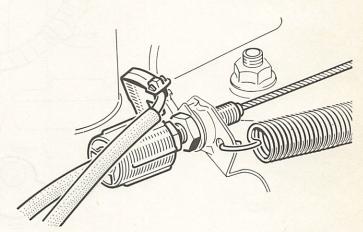
These are solenoid operated ball valves which open or close hydraulic channels to change gear.

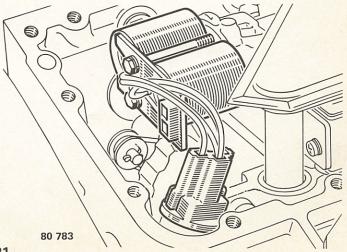
COMPUTER

The computer sends electrical impulses to the solenoid valves according to:

- the AC current supplied by the governor (vehicle speed and engine torque),
- the position of the selector lever.

This unit comprises electronic and mechanical components.





Electrical control units



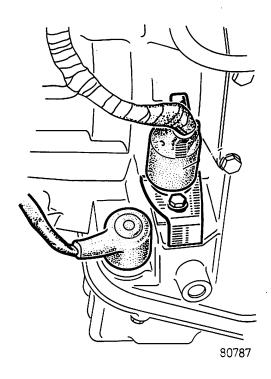
4139-40-41-50

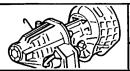
MULTI-FUNCTION SWITCH

The cam moved by the selector lever opens or closes the various electrical circuits depending on the position of the selector lever:

- Starter circuit,
- Reversing lights circuit (lever in R),
- Solenoid ball valves ELl and EL2.

The starter is only activated when the lever is in positions "N" or "P".





Hydraulic control units



4139

OIL PUMP

The involute gear oil pump is driven directly by the engine and supplies all the necessary pressure for the following services:

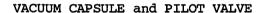
- converter operation,
- gear lubrication,
- and brakes and clutches.

It is located in the rear of the mechanical components casing.

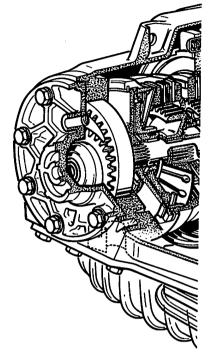
HYDRAULIC DISTRIBUTOR

This ensures:

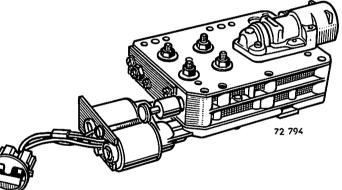
- oil pressure regulation to suit engine load (vacuum capsule and pilot valve).
- pressurized oil feed or release to the clutches and brakes. Ratio changes are determined by the operation of two solenoid ball valves ELl and EL2. They receive their instructions from the governor-computer in the form of electrical impulses.



The vacuum capsule and pilot valve ensure a pressure depending on engine load which determines the feed pressures to the receivers and, as a result, controls gear changing.



69 740 . A



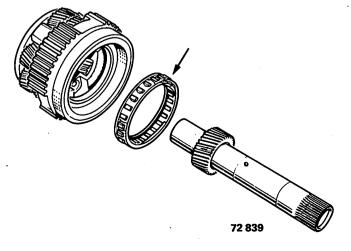
MECHANICAL CONTROL UNITS

FREEWHEEL

This allows torque to be transmitted from the engine to the roadwheels but precludes engine braking.

CLUTCHES and BRAKES

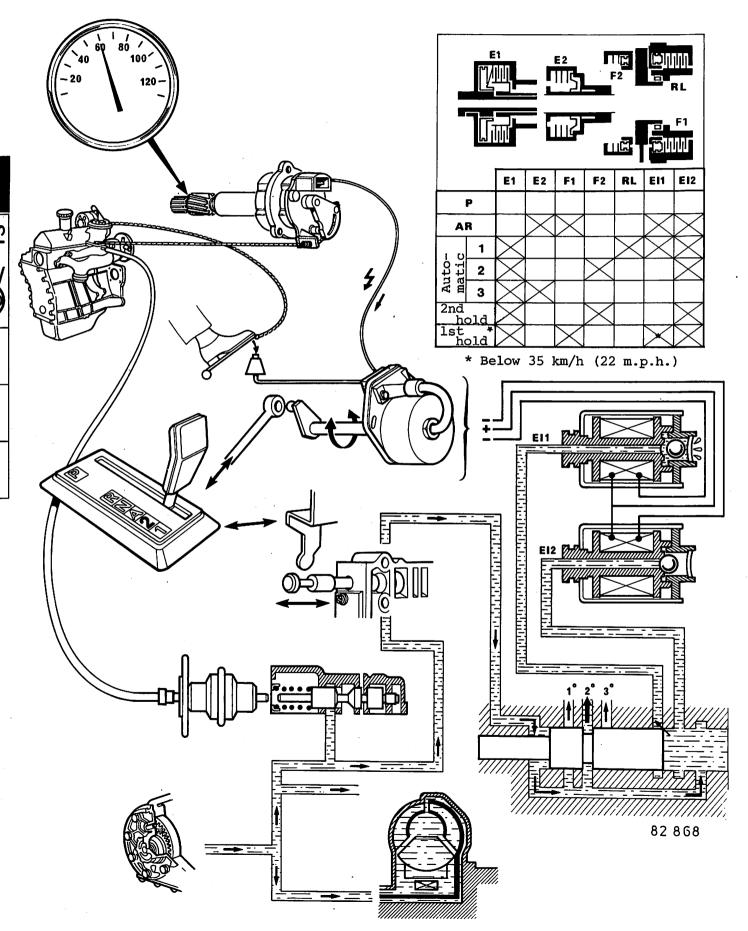
Clutches El and E2 and brakes Fl and F2 are of the multi-disc oil bath type. They are hydraulic receivers which lock or release certain units in the epicyclic gear train depending on their feed which enables various ratios to be obtained.





Operating layout

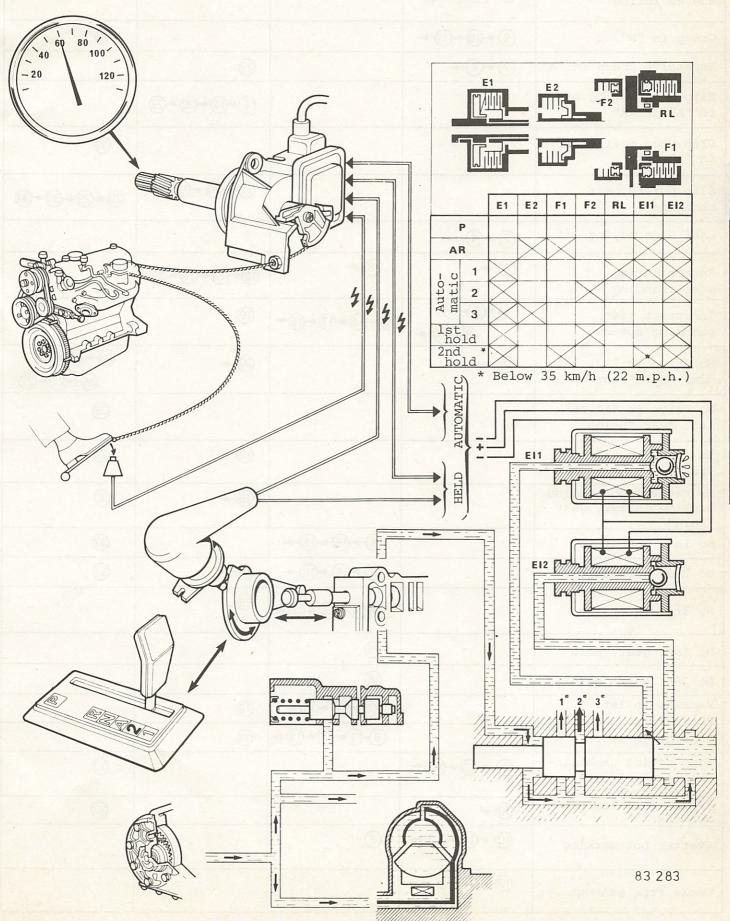






Operating layout





FAULTS	Causes due to transmission auxiliaries	Causes of electrical origin	Causes of hydraulic origin	Causes of mechanical origin
Engine stalls, uneven idling	2-3-4-1 3			
Creep in "N"	9-0-0-			23
Excessive creep in "A"	2 - 4-		27	
Slip when moving off in "A" or "R"			1-12-20-27	
Slip when moving off in "A" only				39
Slip during gear changing			12-20-19	28-29-30-3
Snatch on moving off	2 - 4-			
Snatch during gear changing	⑤→	18→	12-13-19-20	
Incorrect gear changing speeds	4-5-6 8-34-	(5 - (3 - (7 - (8 -	19	
No drive in "A", 1st. gear "Hold" nor "R"	10 →		20→	23 - 23 - 23
No drive in "A" nor lst. gear "Hold"				2 8
No drive in "R" nor 3rd.			19 -	29
No reverse nor engine braking in 1st. gear "Hold"			19	30
No 1st. automatic		8 −1 5 − 18 −		32
No 2nd. automatic		8-15-18-	1	3)
No 3rd. automatic		8-4-5-8-	19	
No 1st. gear "Hold"		(E)		
No 2nd. gear "Hold"		15		
Remains in 1st. automatic		8-14-15-	19	
Remains in 3rd.		8- 7 - 15 - 18 -	19	
Some ratios unobtain- able and selector lever abnormal	9-0-11-			33
"Park" facility not working	10-			<u> </u>
Starter not working	10-11-21-	8		
Smoke from exhaust	13			

FAULTS	Causes due to transmission auxiliaries	Causes of electrical origin	Causes of hydraulic origin	Causes of mechanical origin
Engine stalls, uneven idling	2-3-4			
Creep in "N"	⊕ ►			8
Excessive creep in "A"	2-4-		Ø	
Slip when moving off in "A" or "R"			① - ⑫ - 옣 - ②	
Slip when moving off in "A" only				32
Slip during gear changing			(2 - 20 - 19-	29-39-3 0
Snatch on moving off	2-4-	·	·	
Snatch during gear changing	5-		(9 - 20	
Incorrect gear changing speeds	4-5-6-34-	8-6-3 7-8		
No drive in "A", lst. gear "Hold" nor "R"	10-		20 - 22-	23 - 29 - 29 25 - 27
No drive in "A" nor lst. gear "Hold"				2 3
No drive in "R" nor 3rd.			®	
No reverse nor engine braking in 1st. gear "Hold"			(9 ->	39
No 1st. automatic		8- 37 - 18 -		32
No 2nd. automatic		8- 37 - 18 -	19-	<u> </u>
No 3rd. automatic		8-16-18-	19	
No lst. gear "Hold"	10 →	8-3-6 -	19	
No 2nd. gear "Hold"	10→	®►®		
Remains in 1st. automatic		8−16 −	19	
Remains in 3rd.		⑦-®-®-	(9)	
Some ratios unobtain- able and selector lever abnormal	10 - 11-			3 3
"Park" facility not working	10→			33
Starter not working	⊕ •⊕	® - ፡፡		
Reversing lights not working	3	39		
Smoke from exhaust	13			

1	•	OIL LEVEL
2	•	IDLING
3	•	IGNITION: SPARK PLUGS, CONTACT POINTS, TIMING
4	•	ACCELERATOR CONTROL
5	•	GOVERNOR CABLE
6	•	KICK-DOWN SWITCH ADJUSTMENT
7		FUSES
8	•	HARNESSES, WIRING, PLUGS, SOCKETS, EARTHS
9	•	COMPUTER SETTING
10		SELECTOR LEVER ADJUSTMENT
1	•	REPEATER ON INSTRUMENT PANEL (R.16)
1\\@\@\@\@\@\@\@\@\@\@\@\\\\\\\\\\\\\\	•	OIL PRESSURE SETTING
13		VACUUM CAPSULE or HOSE
14)		GOVERNOR
(15)		COMPUTER
16		GOVERNOR-COMPUTER
(1)		KICK-DOWN SWITCH
18		SOLENOID BALL VALVES
19		HYDRAULIC DISTRIBUTOR
20		PRESSURE REGULATOR
21	•	STARTER SWITCH
22		OIL PUMP
23		OIL PUMP SHAFT
24		TURBINE SHAFT
25	A	FINAL DRIVE
26	•	CONVERTER DRIVING PLATE
27		CONVERTER
28		El CLUTCH
29		E2 CLUTCH
30		Fl BRAKE
31	A	F2 BRAKE
32		FREEWHEEL
\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		MANUAL VALVE MECHANICAL CONTROL
34		ALTERNATOR
35		PILOT VALVE
<u>36</u>		OIL PUMP GAUZE
37	•	MULTI-FUNCTION SWITCH
	1	

- Adjustment on installed transmission
- Overhaul on installed transmission
- Overhaul on removed or dismantled transmission



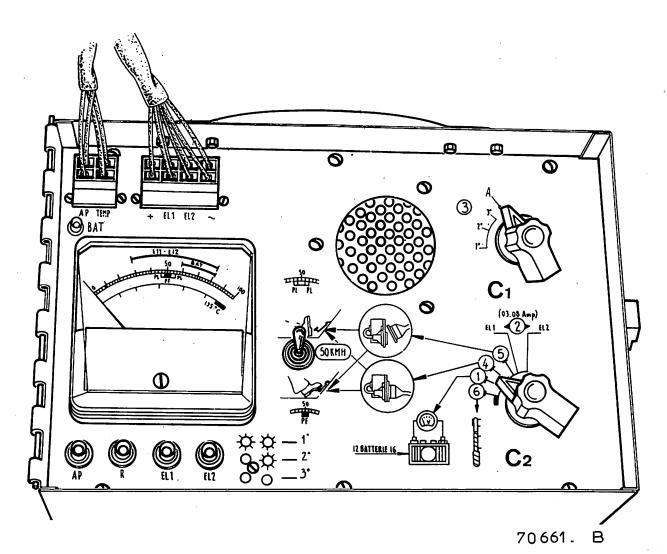
Description



4139

The control box contains:

- an assembly of electrical circuits connected to warning lights
- a meter with graduated scale
- control switches
- a buzzer
- and a 2-tier cover with the harness underneath.



Description



4139

WARNING LIGHTS

Red warning light: BAT

- it illuminates when the control box is switched on.

Blue warning lights: ELl

- it illuminates when current is supplied to EL1.

White warning light: EL2

- it illuminates when current is supplied to EL2.

Green warning light: AP

- it indicates the moment the antipollution system is activated (not used in this instance).

Orange warning light: R

- it indicates the moment the kickdown switch is activated.

BUZZER

A small loudspeaker gives an audible warning when the governor current reaches maximum.

METER

It has graduated scales, enabling successive readings to be taken of:

- transmission oil temperature (the blacked out sector represents the maximum temperature which must not be exceeded).
- governor current.
- battery current with engine switched off or running (O to 100 scale = 20 volts).
- the current strength passing through the ball valve solenoids (the O to 100 scale representing 1 amp).

SWITCH

Used for checking governor and computer.

Cl SWITCH

This switch can be used for 2 purposes:

Position A

To obtain normal driving conditions by means of the selector lever.

Positions 1 - 2 - 3

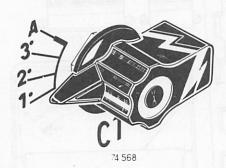
Move the selector lever to A first.

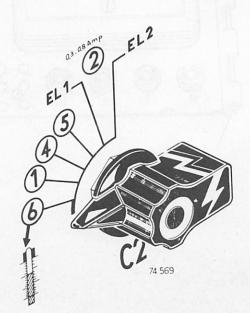
Select ratio desired by turning knob to 1, 2 or 3.

C2 SWITCH

Each one of its positions enables one or other of the following to be checked:

- battery current (1)
- current strength passing through ball valve solenoid ELl and EL2 (2)
- operation of the governor-computer assembly (4)
- oil temperature (6).





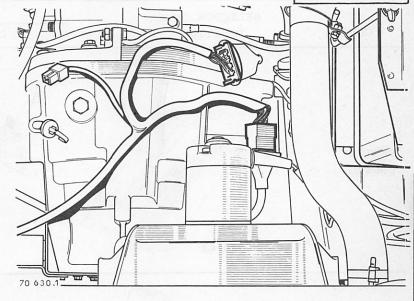
Connections



4139 automatic transmission with aluminium governor or separate plastic governor.

4139

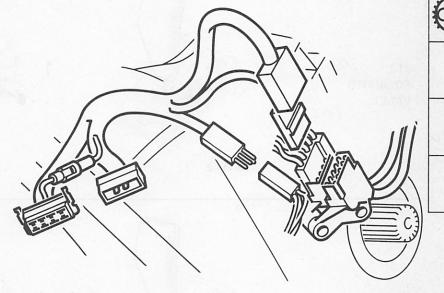
Connect the control box harness to the computer and vehicle harness.



4139 automatic transmission with governor-computer

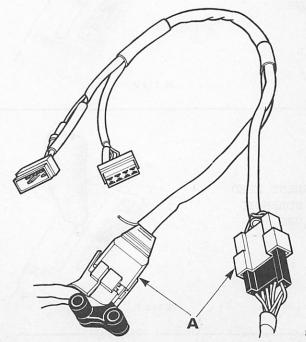
Insert the following between the automatic transmission and the automatic transmission harness:

- connecting harness B.V.664
 (lst. pattern).



77824

or connecting harness B.Vi.664
 (2nd. pattern) : Grey sockets
 (A) connected to the harness.





CONTROL BOX B.Vi.454-06 or B.Vi.797

4139 automatic transmission with governor-computer



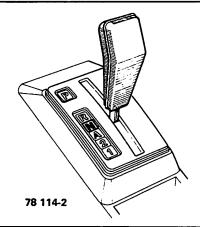
4139

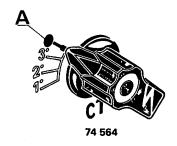
TO CHECK SELECTOR LEVER POSITION

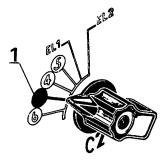
Cl and C2 SWITCHES

CONTROL

BATTERY **VOLTAGE**

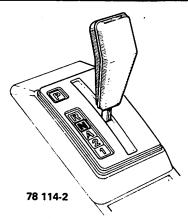




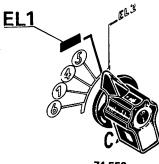


74 557

ELl SOLENOID VALVE

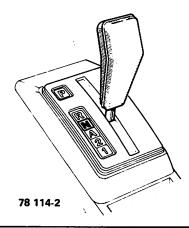






74 558

EL2 SOLENOID VALVE



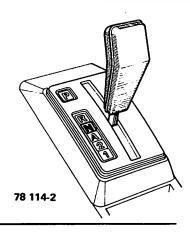


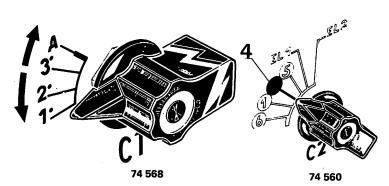
74 563



74 582

CURRENT FEED TO SOLENOID **VALVES**





32 .

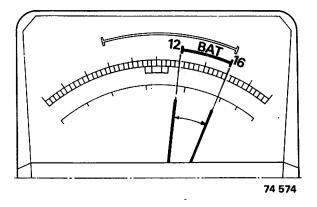
4139 automatic transmission with governor-computer



BOX

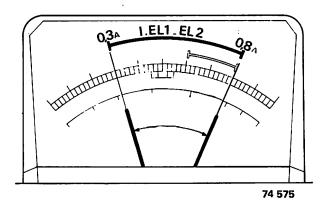
INFORMATION OBTAINED





Incorrect battery voltage (outside 12 to 16 V range) may cause the automatic transmission to malfunction.

REMARKS



If the current is normal (between 0,3 and 0,8 A), the solenoid valves are electrically in order.

If the current is abnormal, check wires and terminal blocks

If the above are serviceable, then one of the solenoid valves is faulty.

The computer may be suspect if an incorrect value (outside 0,3 to 0,8 A range) is displayed when the check is made with switch Cl in "A", (the check with Cl in 1 being correct).

The blue and white warning lights for the solenoid valves should go out or light up depending on the selection made with the Cl switch.



If the current supply to the solenoid valves is incorrect, check the wiring and electrical control units.

If the current supply is correct, the fault is either hydraulic or mechanical.



4139 automatic transmission with governor-computer



4139

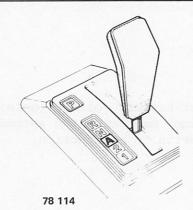
TO CHECK SELECTOR LEVER POSITION

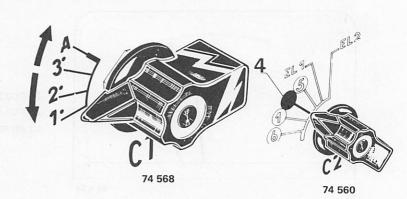
Cl and C2 SWITCHES

CONTROL

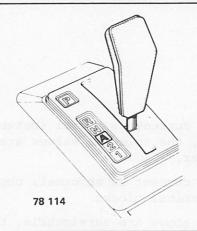
GEAR CHANGING

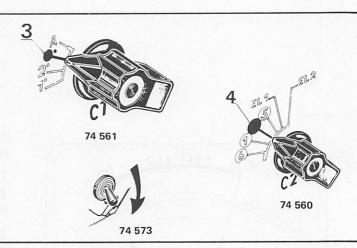
S



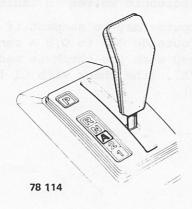


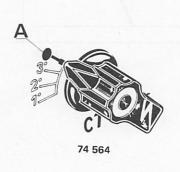
GOVERNOR-COMPUTER

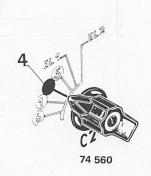




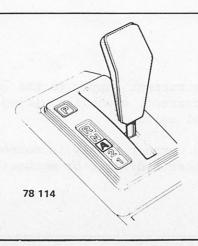
KICK-DOWN SWITCH

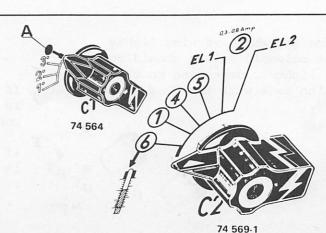


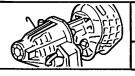




OIL PRESSURE







4139 automatic transmission with governor-computer



4139

BOX

INFORMATION OBTAINED

REMARKS

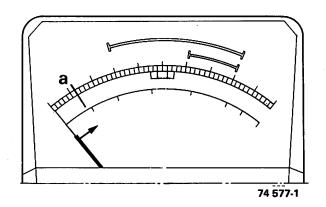
Note speedometer reading.

With Cl in A, the various ratios should be obtainable approximately at the speeds given in the table on page 9.

If the gear changing speeds are incorrect, check:

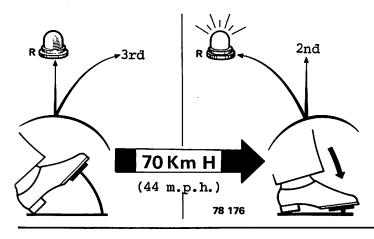
- governor-computer cable adjustment
- all connections
- and the wiring.

Do not use the Cl switch at speeds over 70 km/h (44 m.p.h.) because the change down 3 > 2 will not take place and the transmission will remain in neutral.



A minimum value at least up to graduation (a) should be obtained on the scale.

Change the governor-computer if no current is produced.



If the warming light fails to illuminate, check:

- kick-down switch adjustment
- the contact or connecting wire.

During changing up 2 3, oil temperature 80°C.

Adjust the oil pressure if the values read off are incorrect.



4139 automatic transmission with aluminium governor



4139

CONTROL

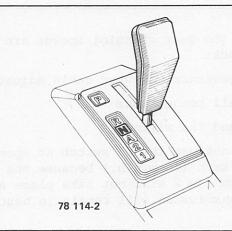
TO CHECK SELECTOR LEVER POSITION

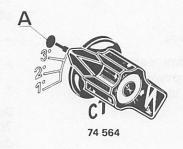
Cl and C2 SWITCHES

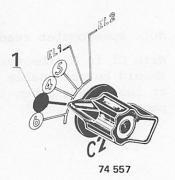
L and CZ

BATTERY VOLTAGE

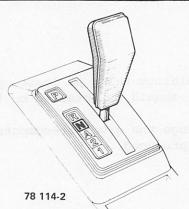
S

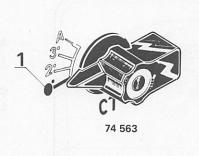


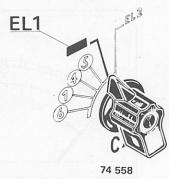




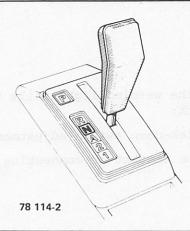
EL1 SOLENOID VALVE

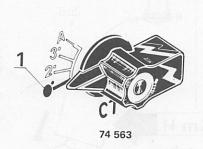






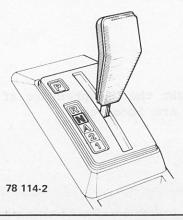
EL2 SOLENOID VALVE

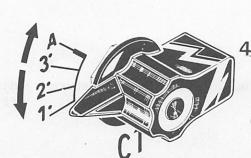




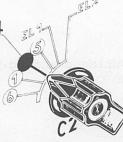


CURRENT FEED TO SOLENCID VALVES





74 568



74 560

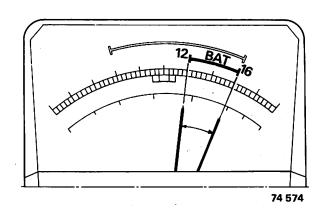


CONTROL BOX B.Vi.454-06 or B.Vi.797

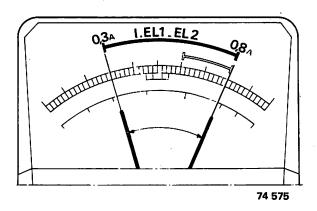
BOX

INFORMATION OBTAINED





Incorrect battery voltage (outside 12 to 16 V range) may cause the automatic transmission to malfunction.

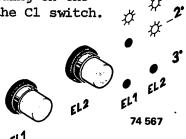


If the current is normal (between 0,3 and 0,8 A) the solenoid valves are electrically in order.

If the current is abnormal check wires and terminal blocks.

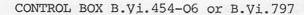
If the above are serviceable, then one of the solenoid valves is faulty.

The blue and white warning lights for the solenoid valves should go out or light up depending on the selection made with the Cl switch.



If the current supply to the solenoid valves is incorrect, check the wiring and electrical control units.

If the current supply is correct, the fault is either hydraulic or mechanical.







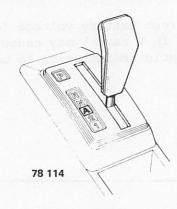
4139

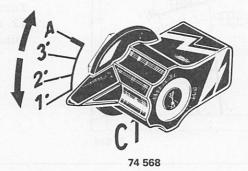
TO CHECK SELECTOR LEVER POSITION

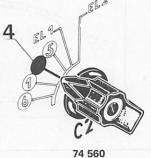
Cl and C2 SWITCHES

CONTROL

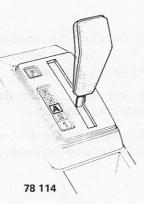
GEAR CHANGING

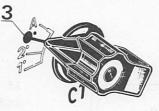




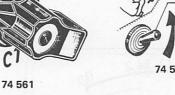


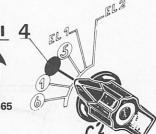
GOVERNOR CURRENT Computer connected in "light throttle" (PL) position





(37 m.p.h.)





Drive along at a speed above 60 km/h

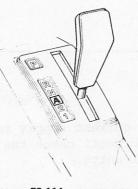
74 560

Release accelerator completely.

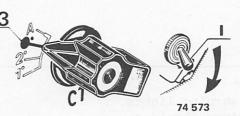
The buzzer will sound when the speed, decreasing, descends to 50 km/h (31 m.p.h.).

At this instant, read off the governor current on the O-100 scale.

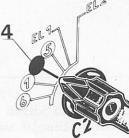
GOVERNOR CURRENT Computer connected in "Full throttle" (PF) position.



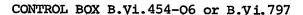
78 114

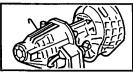


74 561



Accelerate hard using the kick-down switch and brake at the same time to obtain a speed of 50 km/h (31 m.p.h.) as signalled by the buzzer. At this instant, read off the governor current on the 0-100 scale.







4139

BOX

INFORMATION OBTAINED

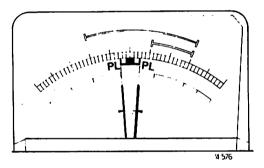
REMARKS

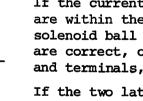
Note the speedometer reading.

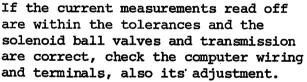
With Cl in A the various ratios should be obtainable approximately at the speeds given in the table on page 9.

If the gearchanging speeds are incorrect, check:

- Adjustment of the governor computer cable
- connections
- wiring.

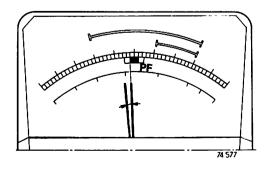






If the two latter items are correct and the breakdown persists, change the computer.

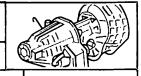
If the measurements read off are not within the tolerances there is a fault in the governor or in the computer.







4139 automatic transmission with aluminium governor



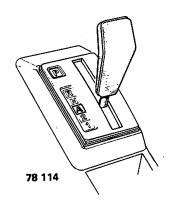
4139

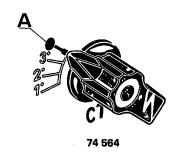
TO CHECK SELECTOR LEVER POSITION

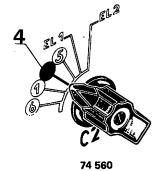
CONTROL

Cl and C2 SWITCHES

KICK-DOWN SWITCH

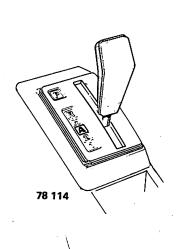


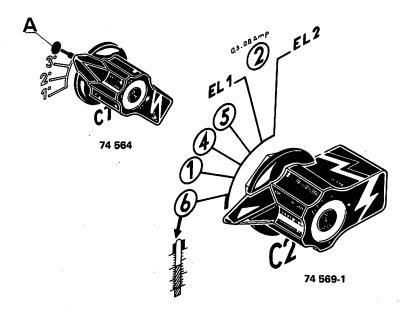




74 560

OIL PRESSURE





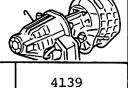


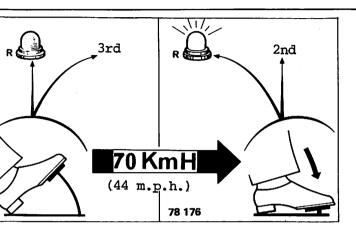
4139 automatic transmission with aluminium governor



BOX

INFORMATION OBTAINED





REMARKS

If the warning light fails to illuminate, check:

- the kick-down switch adjustment
- the contact or connecting wire.

On changing up 2 3, oil temperature 80°C. Adjust the pressure if the values read are incorrect.



4139 auto-transmission with separate plastic governor



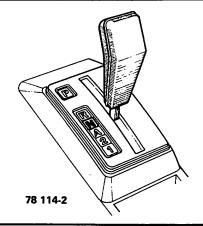
4139

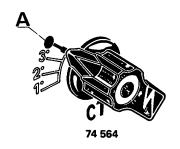
TO CHECK SELECTOR LEVER POSITION

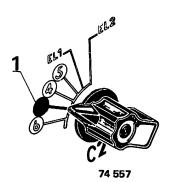
Cl and C2 SWITCHES

CONTROL

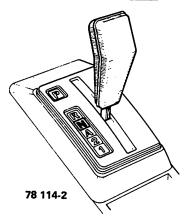
BATTERY VOLTAGE



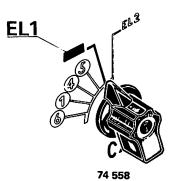




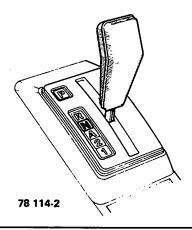
EL1 SOLENOID VALVE







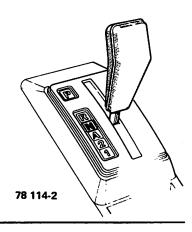
E12 SOLENOID VALVE

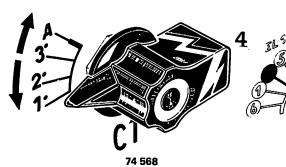






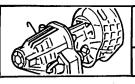
CURRENT FEED TO SOLENOID VALVES





74 560

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4139 auto-transmission with separate plastic governor

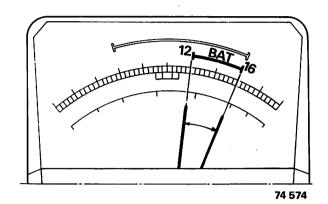


4139

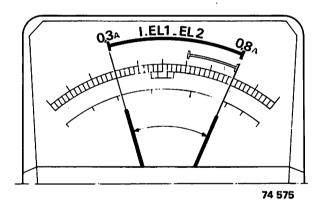
BOX

INFORMATION OBTAINED





Incorrect battery voltage (outside 12 to 16 V range) may cause the automatic transmission to malfunction.

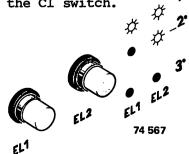


If the current is normal (between 0,3 and 0,8 A) the solenoid valves are electrically in order.

If the current is abnormal, check wires and terminal blocks.

If the above are serviceable, then one of the solenoid valves is faulty.

The blue and white warning lights for the solenoid valves should go out or illuminate depending on the selection made with the Cl switch.



If the current supply to the solenoid valves is incorrect, check the wiring and electrical control units.

If the current supply is correct, the fault is either hydraulic or mechanical.





4139 auto-transmission with separate plastic governor



4139

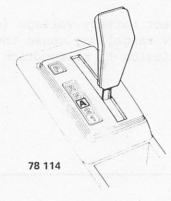
CONTROL

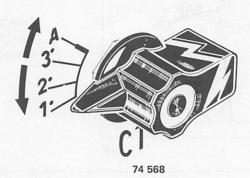
TO CHECK SELECTOR LEVER POSITION

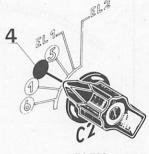
an graduation and

Cl and C2 SWITCHES

GEAR CHANGING

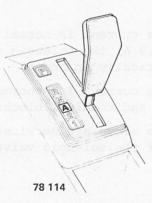


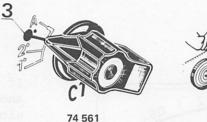


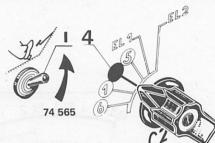


74 560

GOVERNOR
CURRENT
Computer
connected in
"Light throttle"
(PL) position







74 560

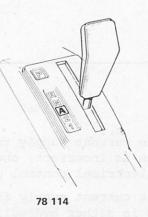
Drive along at a speed above 60 km/h (37 m.p.h.).

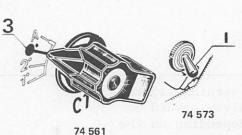
Release accelerator completely.

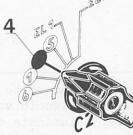
The buzzer will sound when the speed decreasing descends to 50 km/h (31 m.p.h.).

At this instant read off the O to 100 scale.

GOVERNOR
CURRENT
Computer
connected in
"Full throttle"
(PF) position







74 560

Accelerate hard using the kick-down switch and brake at the same time to obtain a speed of 50 km/h (31 m.p.h.) as signalled by the buzzer. At this instant, read off the governor current on the O to 100 scale.



4139 auto-transmission with separate plastic governor



4139

BOX

REMARKS

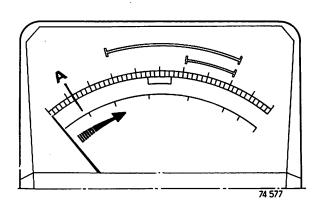
INFORMATION OBTAINED

Note the speedometer reading.

With Cl in A, the various ratios should be obtainable approximately at the speeds given in the table on page 9.

If the gear changing speeds are incorrect, check:

- Adjustment of the governor computer cable
- connections
- wiring.



If the current measurements read off are within the tolerances and the solenoid ball valves and transmission are correct, check the computer wiring and terminals, also its adjustment.

If the two latter items are correct and the breakdown persists, change the computer.

If the measurements read off are not within the tolerances, there is a fault in the governor or in the computer.



4139 auto-transmission with separate plastic governor



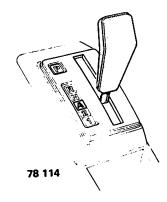
4139

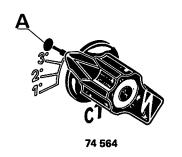
OT CHECK SELECTOR LEVER POSITION

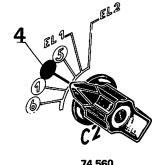
CONTROL

Cl and C2 SWITCHES

KICK-DOWN SWITCH

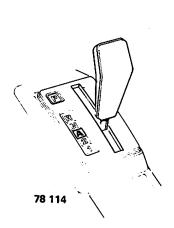


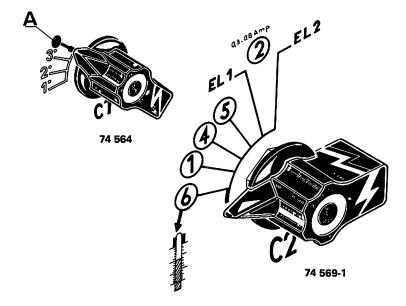


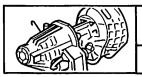


74 560

OIL PRESSURE







4139 auto-transmission with separate plastic governor

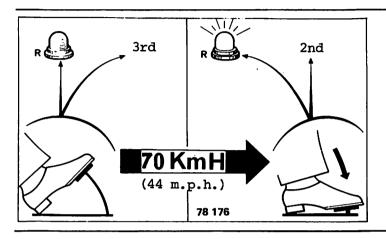


4139

BOX

REMARKS

INFORMATION OBTAINED



If the warning light fails to illuminate, check:

- kick-down switch adjustment
- the contact or connecting wire.

During changing up 2 ≥ 3, oil temperature 80°C.

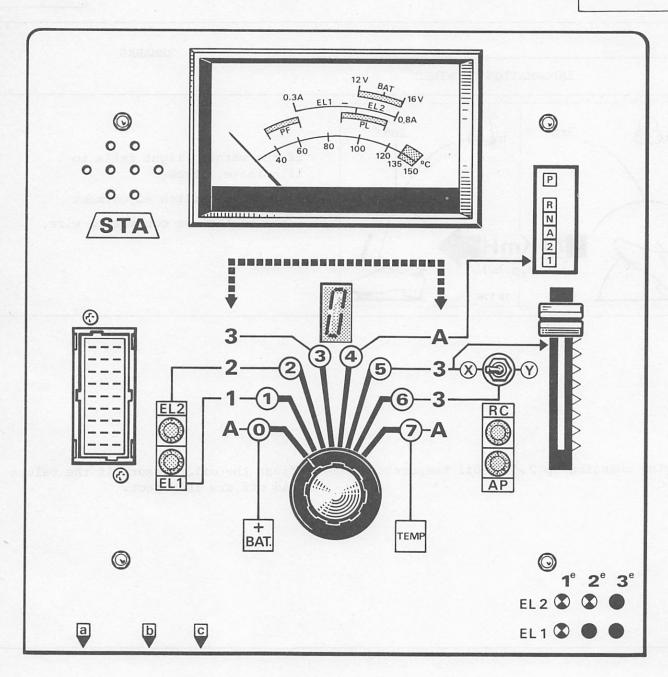
Adjust the oil pressure if the values read off are incorrect.



Description



4139



This is a shockproof container holding the following:

- function warning lights
- potentiometer
- graduated scale and needle (galvanometer)
- digital display
- buzzer
- switches
- 2 cables for connecting to vehicle
- and 3 fuses.



Description



4139

Warning lights

- Yellow warning light ELl : illuminates when current is supplied in solenoid

valve 1.

- Yellow warning light EL2 : illuminates when current is supplied to solenoid

valve 2.

- Red warning light AP : indicates anti-pollution system in operation

(US vehicles)

- Green warning light RC : illuminates the instant the kick-down switch is

activated.

- Digital display : indicates operation of multiple switch and

computer condition.



Simulates governor action.

Switch

For governor type selection

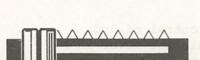
Cables

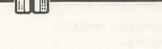
There are two: the longer connects the control box to the gearbox and the smaller serves as an adaptor lead for some types of automatic transmissions.

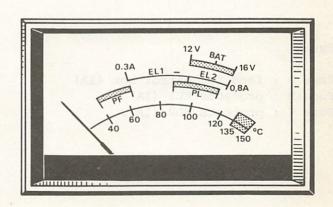
Galvonmeter

There are 4 graduated scales enabling successive readings to be taken of:

- governor current
- battery current with engine switched off or running
- current strength passing through solenoid valves.
- governor current in 2 sectors: full throttle (PF) and light throttle (PL).
- transmission oil temperature (red sector represents maximum temperature which must not be exceeded).



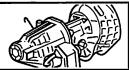












Description



4139

Switch

For selecting all test phases covered by the control box:

- Position 0 : battery current with engine switched off or running

- Position 2 : measuring EL2 current and feed; (over-riding control of 2nd. ratio with selector lever in A on vehicle).

- Position 4: checking multi-function switch using digital display.

- Position 5: sending impulse to computer to check its operation.

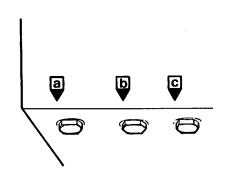
- Position 6: testing governor using galvanometer and buzzer.

- Position 7: measuring transmission oil temperature.

Fuses

Fuse A : feed to control box (1A)

Fuse B : protects EL1 (1A)
Fuse C : protects EL2 (1A).



FUSES



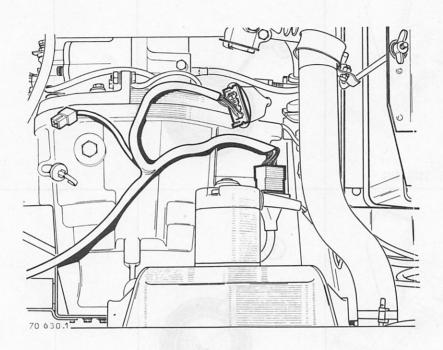
Connections



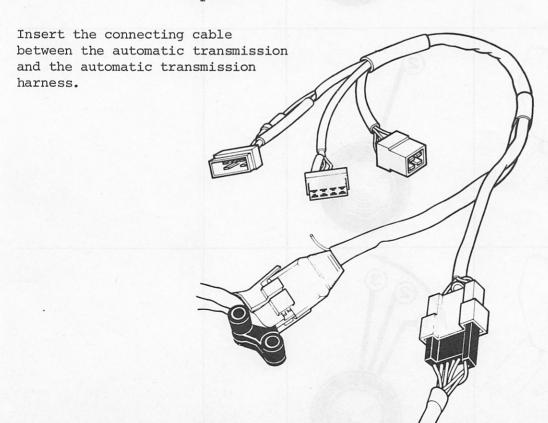
4139

CONNECTING THE CONTROL BOX

On 4139 automatic transmission with aluminium governor or separate plastic governor.



On 4139 automatic transmission with governor-computer.





4139 automatic transmission with governor-computer



4139

					4139
	TO CHECK	SELECTOR LEVER POSITION	SWITCH	⊗ ••••••••••••••••••••••••••••••••••••	
SI	BATTERY VOLTAGE	ENGINE IDLING			
	EL1 SOLENOID VALVE				
	EL2 SOLENOID VALVE		2		
	CURRENT FEED TO SOLENOID VALVES		2 3		

4139 automatic transmission with governor-computer

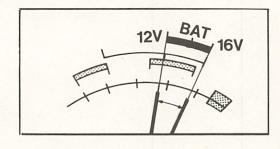


4139

S

INFORMATION OBTAINED

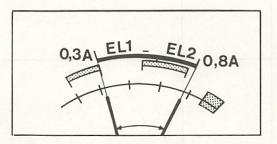




Incorrect battery voltage may cause the automatic transmission to malfunction.

NOTE: this test may also be made when driving along.

Check box fuses a, b and c if voltage is nil.





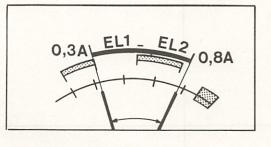
If the current is normal (between 0,3 and 0,8 amp), the solenoid valve is electrically in order.

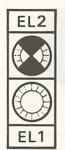
If the current is abnormal:

- check wires and terminal blocks,
- if the above are in order, the solenoid valve is faulty.

NOTE: this test may also be made when driving along.

Check box fuses a, b and c if current is used.





If the current is normal (between 0,3 and 0,8 amp), the solenoid valve is electrically in order.

If the current is abnormal:

- check wires and terminal blocks,
- if the above are in order, the solenoid valve is faulty.

NOTE: this test may also be made when driving along.

Check box fuses a, b and c if current is used.

EL2



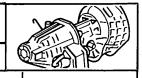


If the feed to the solenoid valves is faulty, check cables and electrical control units.

The fault will be either mechanical or hydraulic if the feed is correct.



4139 automatic transmission with governor-computer



						4139
•	TO CHECK	SELECTOR LEVER POSITION	SWITCH	⊗ ••••••••••••••••••••••••••••••••••••		
SI >>	GEAR CHANGING					
	MULTI- FUNCTION SWITCH	ENGINE STOPPED IGNITION "ON"	4			
	COMPUTER TEST	ENGINE IDLING HANDBRAKE APPLIED	54		Slowly to both	from top



4139 automatic transmission with governor-computer



4139

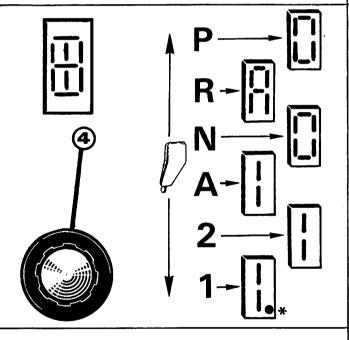
INFORMATION OBTAINED

REMARKS

The various speeds should be obtainable approximately at the speeds given in the table, on page 9.

If the gear changing speeds are incorrect, check:

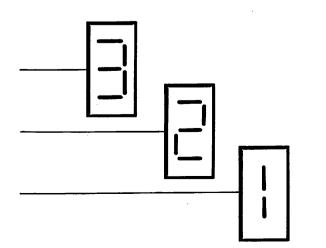
- adjustment of the governor cable
- connections
- and wiring.



Digital display/reading.

If there is a fault:

- check harness
- if the harness is sound, change the multi-function switch.
- * The display of a dot indicates that the speed is "held".



This test is only valid if the battery current exceeds 12V.

If there is a fault:

- check the harnesses
- if the harnesses are sound, change the governor-computer.



4139 automatic transmission with governor-computer



TO CHECK SELECTOR LEVER FOSITION COMPUTER TEST ENGINE IDLING HANDERAKE AFFLIED COMPUTER TEST COMPUTER TEST				4139
ENGINE IDLING HANDBRAKE APPLIED COMPUTER TEST ENGINE IDLING HANDBRAKE APPLIED Slowly from bottom to top	TO CHECK		SWITCH	
COMPUTER TEST ENGINE IDLING Slowly from top to bottom, then	TEST	ENGINE IDLING	5	
		ENGINE IDLING	5	Slowly from top to bottom, then
56 Slowly from bottom to top	•		56	Slowly from bottom to top



4139 automatic transmission with governor-computer



4139

REMARKS INFORMATION OBTAINED This test is only valid if the battery current exceeds 12V. If there is a fault: - check the harnesses, - if the harnesses are sound, change the governor-computer. This test is only valid if the battery current exceeds 12V. If there is a fault: - check the harnesses, - if the harnesses are sound, change the governor-computer. Note: the display of a dot indicates that the ratio is "held" by the transmission itself.



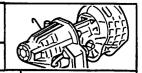
4139 automatic transmission with governor-computer



4139

				4139	
TO CHECK	SELECTOR LEVER POSITION	SWITCH	⊗ ••••••••••••••••••••••••••••••••••••		- -
GOVERNOR CURRENT- "LIGHT THROTTLE" (PL)		6			
GOVERNOR CURRENT- "FULL THROTTLE" (PF)		6		•	_
KICK-DOWN SWITCH	SPEED 70 km/h (44 m.p.h.) approx.	7		•	_
OIL TEMPERATURE		58			

4139 automatic transmission with governor-computer



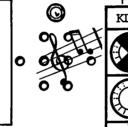
4139

₩**Q**

INFORMATION OBTAINED



The buzzer will Release accelerator. sound at about 50 km/h (31 m.p.h.); the needle should then be in the PL zone.



Accelerate hard, kick-down warning light illuminated, and brake at the same time to obtain a speed of 50 km/h (31 m.p.h.) as signalled by the buzzer; the needle should then be in the PF zone.

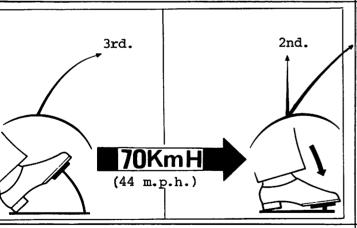
REMARKS

The transmission oil temperature must be 85°C for this test.

If the current measurements read off are within the tolerances and the solenoid ball valves and transmission are correct, check the governorcomputer wiring and terminals.

If the latter are correct and the breakdown persists, change the governorcomputer.

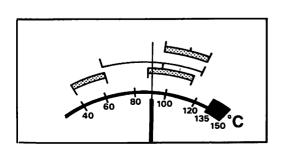
If the current measurements read off are outside the tolerances, there is a fault in the governor or computer.





If the kick-down warning light fails to illuminate, check:

- kick-down switch adjustment
- the switch itself
- and the connecting wire.



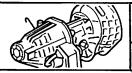
Min. oil temperature for tests 85°C. Max. oil temperature for tests 135°C.



4139 automatic transmission with aluminium governor



					4139
•	то снеск	SELECTOR LEVER POSITION	SWITCH	\otimes	^^^^
<u>s</u>	BATTERY VOLTAGE	ENGINE IDLING			
9	EL 1 SOLENOID VALVE				
	EL 2 SOLENOID VALVE	COSTA DE LA COSTA DEL COSTA DE LA COSTA DE LA COSTA DEL COSTA DE LA COSTA DEL COSTA DE LA COSTA DEL COSTA DE LA COSTA DEL COSTA DE LA COST	2		
	CURRENT FEED TO SOLENOID VALVES		23		

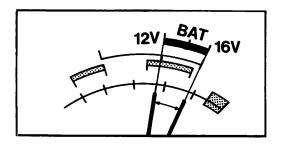




4139

INFORMATION OBTAINED

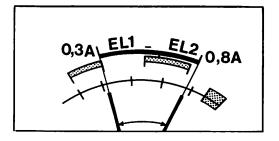


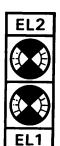


Incorrect battery voltage (outside 12 to 16 V range) may cause the automatic transmission to malfunction.

Note: this test may also be carried out when driving along.

Check box fuses a, b and c if voltage is nil.





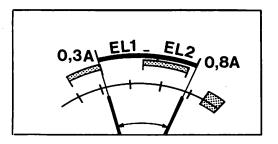
If the current is normal (between 0,3 and 0,8 A) the solenoid valves are electrically in order.

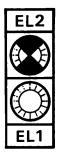
If the current is abnormal, check wires and terminal blocks.

If the above are serviceable, then the solenoid valve is faulty.

Note: this test may also be carried out when driving along.

Check box fuses a, b and c if current is nil.





If the current is normal (between 0,3 and 0,8 A) the solenoid valves are electrically in order.

If the current is abnormal, check wires and terminal blocks.

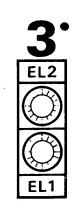
If the above are serviceable, then the solenoid valve is faulty.

Note: this test may also be carried out when driving along.

Check box fuses a, b and c if current is nil.

1°
EL2
(***)
EL1





If the current supply to the solenoid valves is incorrect, check the wiring and electrical control units.

If the current supply is correct, the fault is either hydraulic or mechanical.



4139 automatic transmission with aluminium governor



1

4139

				4139
TO	SELECTOR LEVER POSITION	SWITCH	⊗⊚ ⊙	
GEAR CHANGING				
GOVERNOR CURRENT- "LIGHT THROTTLE" (PL)	SPEED ABOVE 60 km/h (37 m.p.h.)	6	⊗© ¥	
GOVERNOR CURRENT- "FULL THROTTLE" (PF)		62	→	





4139

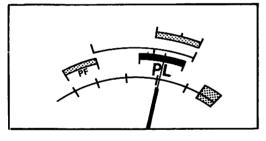
INFORMATION OBTAINED

REMARKS

The various ratios should be obtainable at approximately the speeds given in the table on page 9.

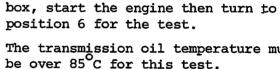
If the gear changing speeds are incorrect,

- adjustment of the governor cable
- connections
- and wiring.





Release accelerator. The buzzer will sound at approximately 50 km/h (31 m.p.h.) and the needle should be lying in the "PL" (Light throttle) zone.



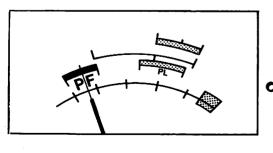
The transmission oil temperature must be over 85°C for this test.

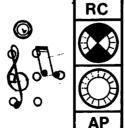
Turn to position 7 on the control

If the current measurements read off are within the tolerances and the solenoid ball valves and transmission are correct, check the computer wiring and terminals also check its setting.

If the latter are correct and the breakdown persists, change the computer.

If the current measurements are outside the tolerances, there is a fault in the governor or computer.





Accelerate hard, kick-down warning light illuminated, and brake at the same time to obtain a speed of 50 km/h (31 m.p.h.) as signalled by the buzzer; the needle should be in the "PF" (Full throttle) zone.



4139 automatic transmission with aluminium governor





4139

TO CHECK	SELECTOR LEVER POSITION	SWITCH	⊗⊕ ♥	
KICK- DOWN SWITCH	SPEED 60 km/h (37 m.p.h.) APPROX.	7		
OIL TEMPERATURE				



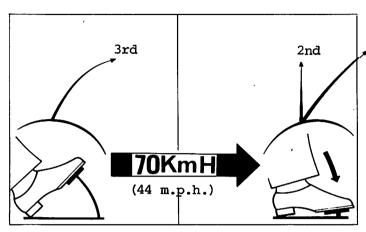
4139 automatic transmission with aluminium governor



4139

INFORMATION OBTAINED

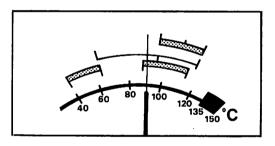






If the kick-down warning light fails to illuminate, check:

- kick-down switch adjustment
 - the switch itself
- and the connecting wire.



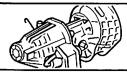
Min. oil temperature for tests 85°C.

Max. oil temperature for tests 135°C.



4139 auto-transmission with separate plastic governor

					4139
	TO CHECK	SELECTOR LEVER POSITION	SWITCH	\otimes	^^^^
8	BATTERY VOLTAGE	ENGINE IDLING			
	EL1 SOLENOID VALVE				
	EL2 SOLENOID VALVE		2		
	CURRENT FEED TO SOLENOID VALVES		23		·



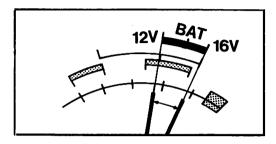
4139 auto-transmission with separate plastic governor



4139

INFORMATION OBTAINED

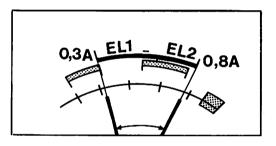


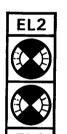


Incorrect battery voltage (outside 12 to 16 V) range may cause the automatic transmission to malfunction.

NOTE: this test may also be carried out when driving along.

Check box fuses a, b and c if the voltage is nil.





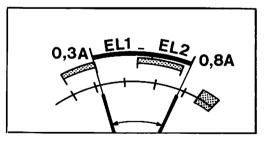
If the current is normal (between 0,3 and 0,8A) the solenoid valves are electrically in order.

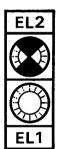
If the current is abnormal:

- check wires and terminal blocks
- if the above are serviceable, the solenoid valve is faulty.

NOTE: this test may also be carried out when driving along.

Check box fuses a, b and c if the current is nil.





If the current is normal (between 0,3 and 0,8A) the solenoid valves are electrically in order.

If the current is abnormal:

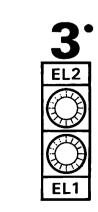
- check wires and terminal blocks
- if the above are serviceable, the solenoid valve is faulty.

NOTE: this test may also be carried out when driving along.

Check box fuses a, b and c if the current is nil.

EL2





If the current supply to the solenoid valves is incorrect, check the wiring and electrical control units.

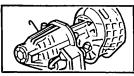
If the current supply is correct, the fault is either hydraulic or mechanical.



4139 auto-transmission with separate plastic governor



					4139
	TO CHECK	SELECTOR LEVER POSITION	SWITCH	⊗ ••••	
S ≥ S	GEAR CHANGING			·	
	COMPLETE	ENGINE IDLING BRAKE APPLIED	5	★	Slowly from top to bottom
	COMPUTER				
		ENGINE IDLING BRAKE APPLIED	68		Slowly from bottom to top



4139 auto-transmission with separate plastic governor



4139

REMARKS INFORMATION OBTAINED The various ratios should be obtainable approximately at the speeds given in the table, on page 9. If the gear changing speeds are incorrect, check: - adjustment of the governor cable - connections - and wiring. This test is only valid if the battery current exceeds 12V. If there is a fault: - check the harnesses - if the harnesses are sound, change the computer. This test is only valid if the battery current exceeds 12V. If there is a fault: - check the harnesses - if the harnesses are sound, change the computer.



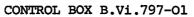
CONTROL BOX B.Vi.797-01

4139 auto-transmission with separate plastic governor



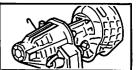
TO CHECK	SELECTOR LEVER POSITION	SWITCH	⊗⊚ ⊙	
COMPUTER	ENGINE IDLING BRAKE APPLIED			Slowly from bottom to top then Slowly from top to bottom
GOVERNOR CURRENT "LIGHT THROTTLE" (PL)	SPEED OVER 60 km/h (37 m.p.h.)			
GOVERNOR CURRENT - "FULL THROTTLE" (PF)		(6)	X© •♥	

70

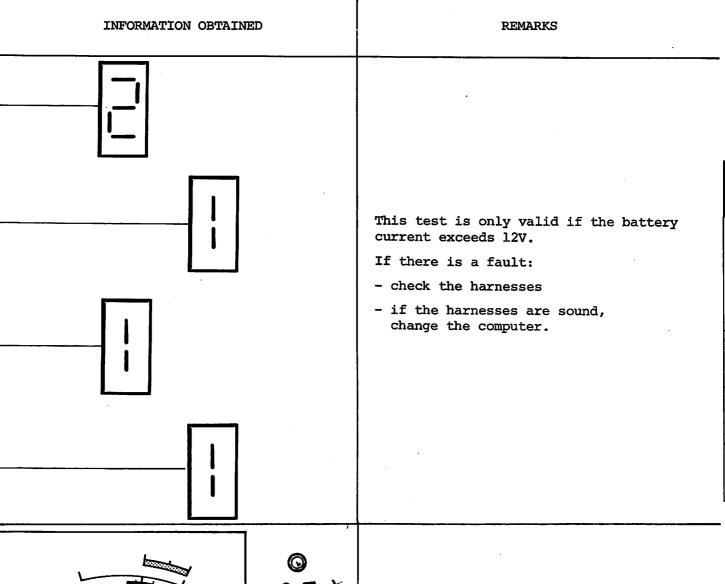


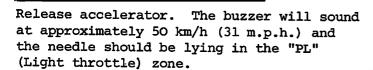


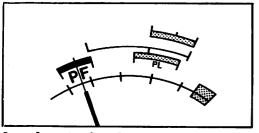
4139 auto-transmission with separate plastic governor



4139







Accelerate hard, kick-down warning light illuminated, and brake at the same time to obtain a speed of 50 km/h (31 m.p.h.) as signalled by the buzzer; the needle should be in the "PF" (Full throttle) zone.

Turn to position 7 on the control box, start the engine then turn to position 6 for the test.

The transmission oil temperature must be over 85°C for this test.

If the current measurements read off are within the tolerances and the solenoid ball valves and transmission are correct, check the computer wiring and terminals also check its setting.

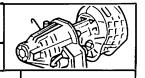
If the latter are correct and the breakdown persists, change the computer.

If the current measurements are outside the tolerances, there is a fault in the governor or computer.



CONTROL BOX B.Vi.797-01

4139 auto-transmission with separate plastic governor



4139

TO CHECK	SELECTOR LEVER POSITION	SWITCH	⊗⊕ ♥	
KICK- DOWN SWITCH	SPEED 80 km/h (44 m.p.h.) APPROX.	7		
OIL TEMPERATURE				·



CONTROL BOX B.Vi.797-01

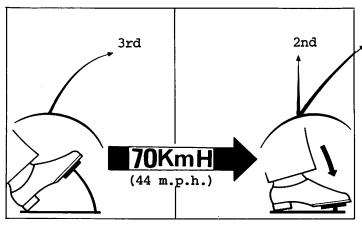
4139 auto-transmission with separate plastic governor



4139

INFORMATION OBTAINED

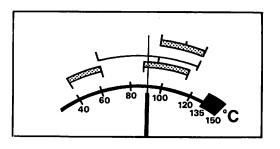






If the kick-down warning light fails to illuminate, check:

- kick-down switch adjustment
 - the switch itself
 - and the connecting wire.



Min. oil temperature for tests 85°C Max. oil temperature for tests 135°C.



Incidents



4139

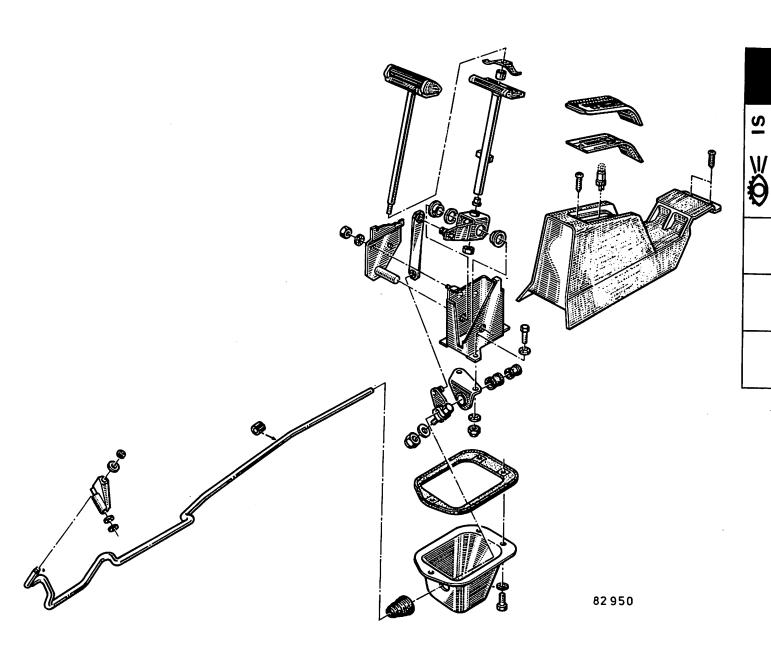
INCIDENTS WHICH COULD BE CAUSED BY THE SELECTOR MECHANISM

- Creep in "N"
- Some ratios unobtainable and selector lever abnormal
- Faulty "Park" operation
- Starter not working
- No drive in "A", 1st. gear "Hold" and "R".

Exploded view



RENAULT 5



Removing - Refitting



RENAULT 5

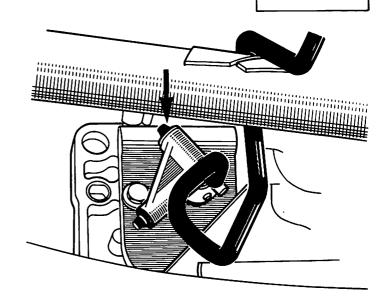
REMOVING

Place selector lever in neutral. Underneath vehicle:

- Remove circlip from control finger.
- Remove cover.
- Unscrew the clevis and control rod bracket nuts.

Inside the vehicle:

- Remove the selector gate.
- Remove the selector lever housing.
- Remove the selector lever support assembly.



REFITTING:

82 835

Inside the vehicle:

- Offer up the selector lever support assembly.
- Place the selector lever in "P" (Park).
- Adjust the control.

Code 2212

ADJUSTING

ADJUSTING

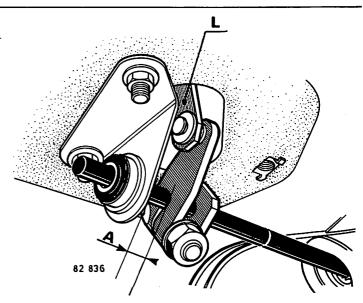
The selector lever must be tilting 10° towards the front when in the "Park" position.

Use the clearance existing in the two bearing bracket bolt holes to obtain this angle.

After the above adjustment, place the selector lever in NEUTRAL resting on the notch in the gate.

Under the vehicle:

- Check that the entry shaft is in neutral.
- Attach the control rod at the entry shaft end.
- Fit the following to the rod:
 - . bellows
 - . cover
 - . lever
 - . and assembled bearing support.

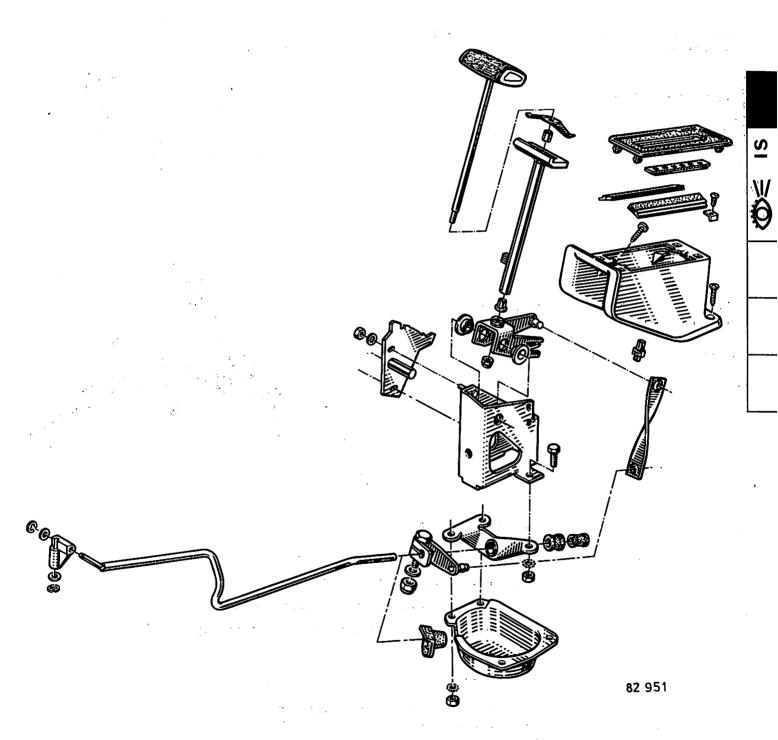


- Fit the bearing support.
- Couple up the link
 (Offer up the link to the ball on the side with the 4 slots).
- Tighten lever (L) in the set position A = 26 mm + 1 (1").
- Attach cover and seal.

Exploded view



RENAULT 12-15-17



Removing - Refitting



RENAULT 12-15-17

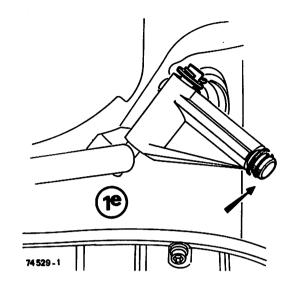
REMOVING

Place selector lever in 1st. gear "Hold" position.

Code 2218

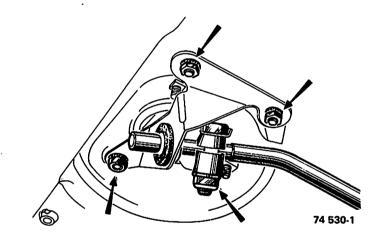
Under the vehicle:

Remove the circlip from the computer control arm.



Unscrew the clevis and control rod bracket nuts.

Remove control rod.



Inside the vehicle:

Remove the selector lever cover.

Disconnect the switch wires.

Unscrew the lever bracket fixing bolts.

Remove the bracket-selector lever assembly.

REFITTING

Place the selector lever and computer control arm in 1st. gear "Hold".

Adjust the control.

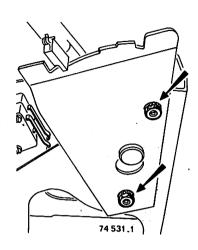
Adjusting



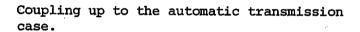
RENAULT 12-15-17

ADJUSTING

Selector lever position



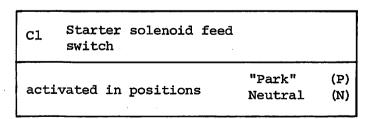
The selector lever (S) must be vertical when in the "Park" position: loosen the gate fixing bolts and adjust the gate for this.



Place selector lever (S) and the computer input shaft in 1st. gear "Hold".

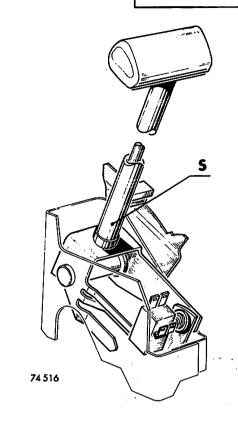
Tighten lever (L) in the set position: A = 17 mm + 1 (5/8).

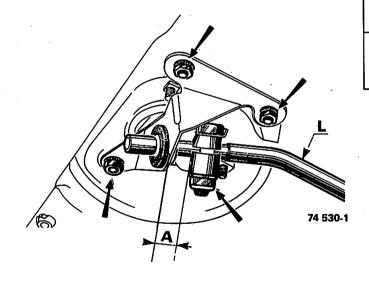
SWITCHES

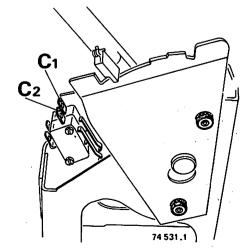


C2 Reversing lights switch

activated in reverse (R) position





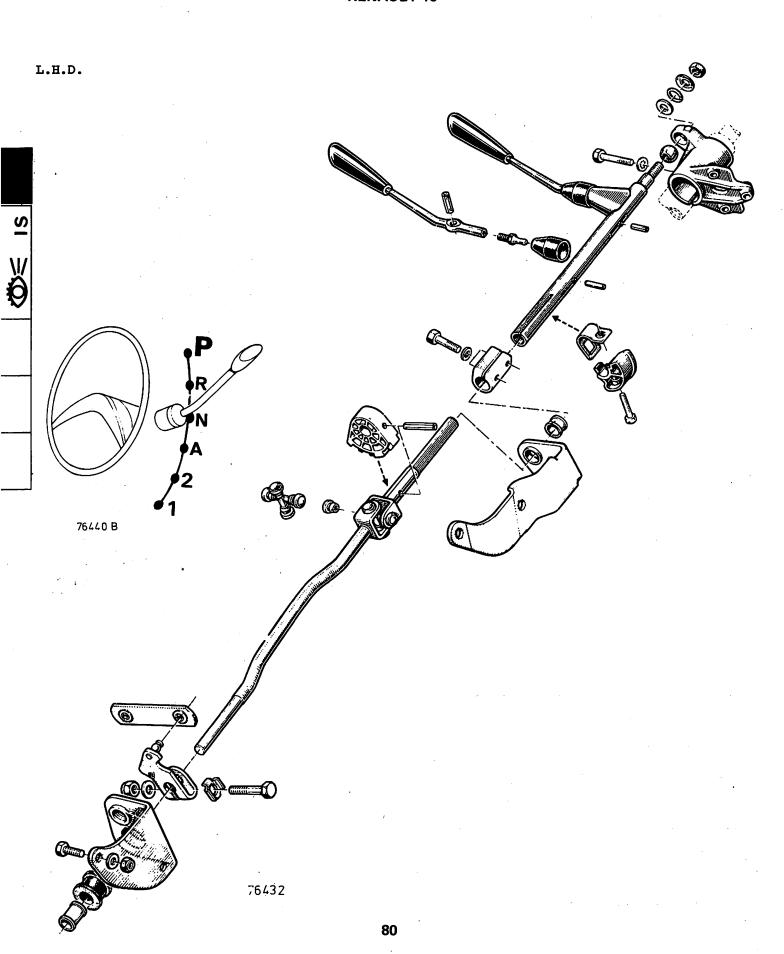




Exploded view



RENAULT 16



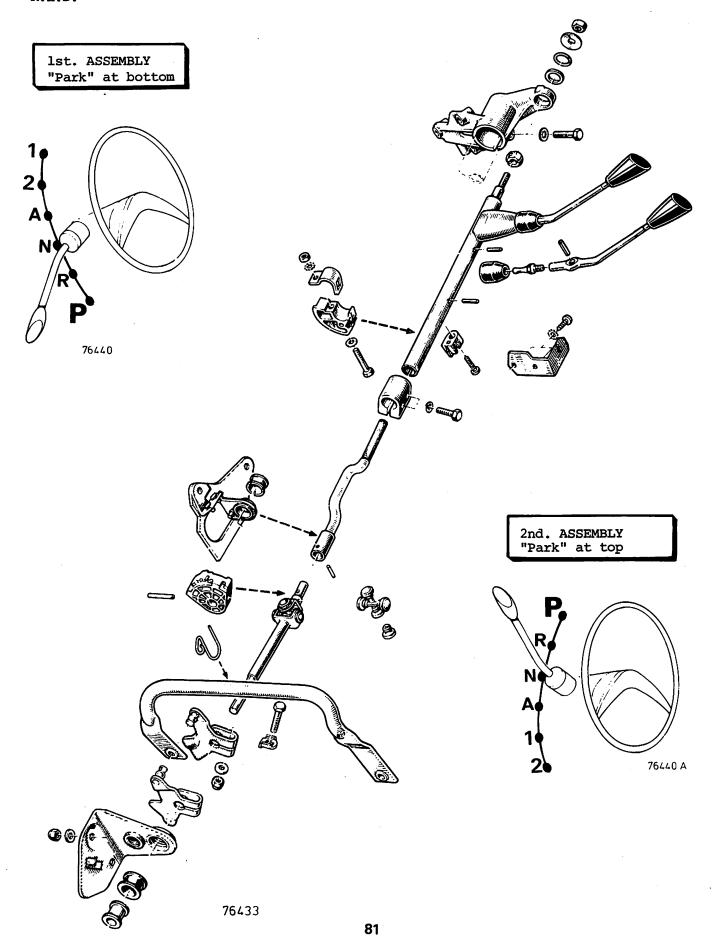
Exploded view



RENAULT 16

<u>S</u>

R.H.D.





Codes 2218-2219 Removing - Refitting



RENAULT 16

SPECIAL TOOLS

Methods Reference	Description	Essential	Useful	Specifically for vehicle
Dir.21-01	Steering wheel puller			
B.Vi.315	Wrench			
B.Vi.31-01	Set of drifts			

REMOVING

Disconnect the battery.

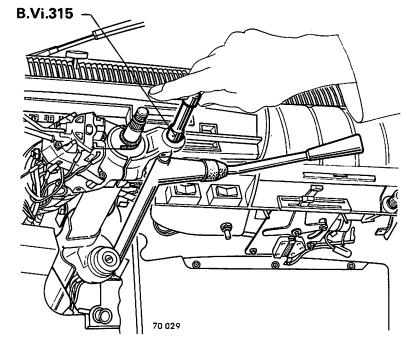
Remove:

- the steering wheel using puller Dir.21-O1.
- both half covers.

Mark the position of the combination lighting - direction indicator switches in relation to the steering column.

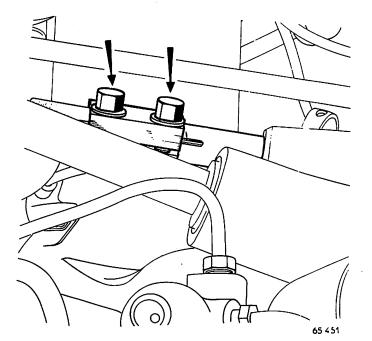
Remove the lighting-direction indicator switches bolt.

Unscrew the ball joint locknut on the selector control rod.



Unlock and unscrew the ball joint using wrench B.Vi.315 gradually withdrawing the switches bracket.

Unlock and unscrew the two bolts in the clamp holding the selector control tubes.



Removing - Refitting

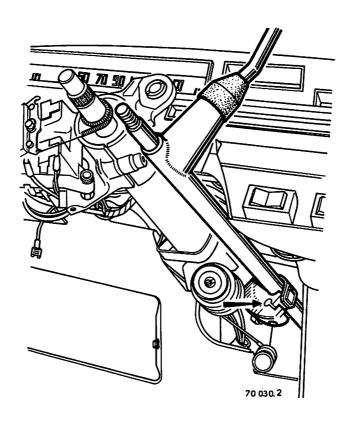


RENAULT 16

Pull back the light switches bracket then release the control shaft by pivoting it round the steering column.

Free the selector repeater cable from the drum.

Remove the shaft-lever assembly.



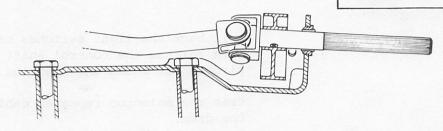


Removing - Refitting



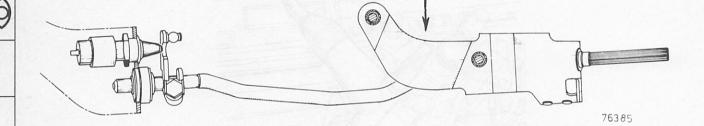
RENAULT 16

L.H.D.



76385 A

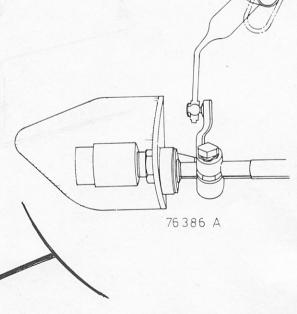
Disconnect the link from the control lever.
Unscrew the two bracket fixing nuts.
Free the control from the top bracket.

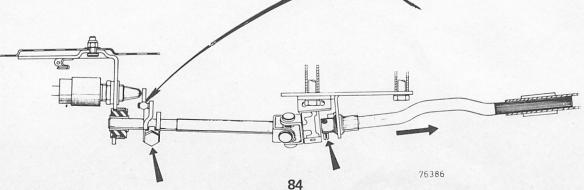


R.H.D.

Disconnect the link.

Punch out the rollpin from the bent tube using drift B.Vi.31-Ol. Loosen the clamp on the end. Remove the bent tube. Tilt the selector gate to free it. Remove the lower part of the control.







Overhauling



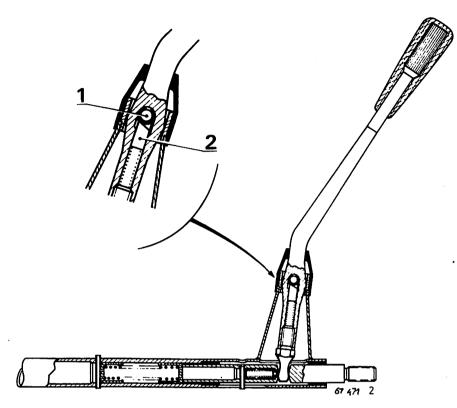
OVERHAULING

Top part

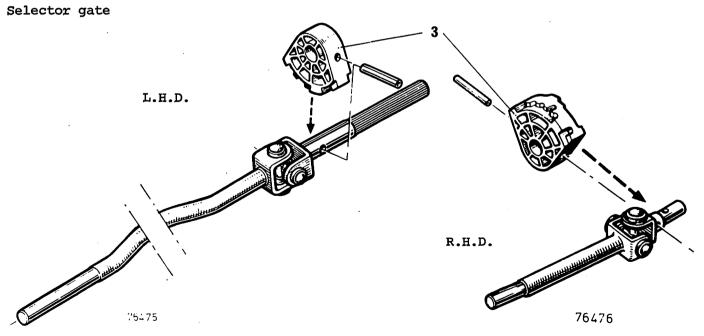
Only the selector lever may be changed.

Retain the current alignment when re-assembling:

- of the rollpin slot (1): it must be parallel to the lever centreline,
- and the slope of plunger (2).



Control at transmission end



Punch out the rollpin using drift B.Vi.31-Ol to change selector gate (3).

Re-assemble so that the 6-slot section faces the universal joint.

For L.H.D., align the gate correctly to the lower tube bend (see sketch).

Refitting

RENAULT 16

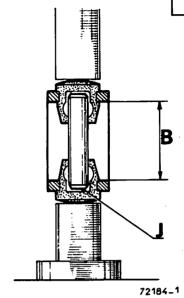
Universal joint:

The universal joint consists of a steel universal cross and four plastic cup bearings: cup bearings and cross can be changed.

Insert a distance piece between arms (B) of the cross supports so as not to retighten them when installing the cup bearings.

Smear the outside of the 4 cup bearings with a little grease and press them in two at a time.

After assembly, a clearance of J = 1 mm (1/32") should exist at the end of each cross.

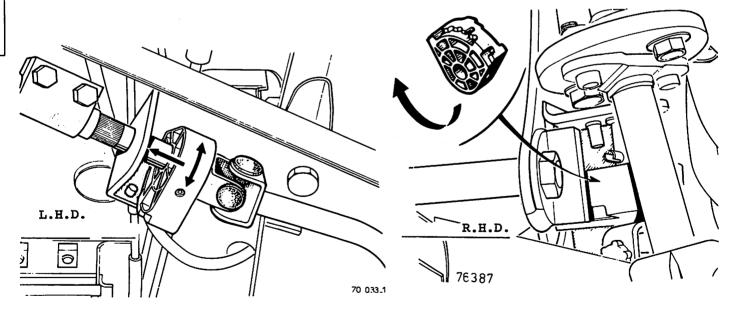


REFITTING

S

Fit the bottom control, inserting it behind the steering bracket.

Position the selector gate on the two bracket lugs by turning and pushing upwards. Fix the control bottom bracket.



Reassemble:

- the bent tube between the top part and the universal joint.
- the selector gate and its pin (position it on the two bracket lugs by turning and pushing upwards).

Rollpin the connecting tube and gate shaft.

Insert the tube-lever assembly fitted with the selector drum.

Fit the clamp on the end of the control and couple up both assemblies.

Fix the tube-lever assembly by tightening the shaft ball joint using wrench B.Vi.315 until it rotates without play on its seat:

Then adjust the selector control.

Adjusting

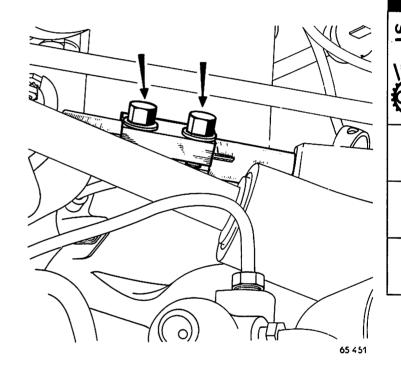


RENAULT 16

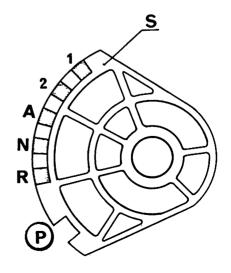
Adjusting the upper part of the control

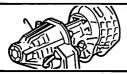
In order to carry out the correct adjustment of the upper part of the selector control, it is necessary to remove the lighting switch covers, to disconnect the computer link and to unscrew the starter switch.

Unscrew the two screws in the clamp holding the two parts of the control tube.



Engage the selector gate (S) in the "Park" notch and push it up against the bottom peg.





Adjusting



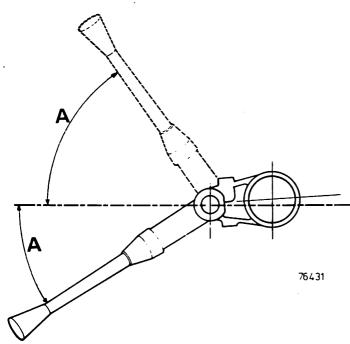
Unscrew locking bolt (V) from the lighting switch bracket.

Remove the locknut from the selector rod ball joint.

Position the selector lever:

Y = 208 mm (8-3/16") X = 25 mm (63/64") Angle A = 55° for both L.H.D. and R.H.D. with "Park" position upwards. 33° for R.H.D. with

"Park" position downwards.



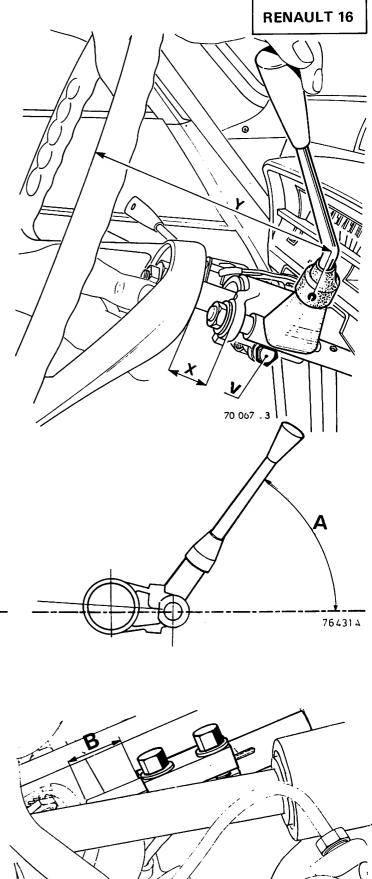
Hold the gate on the bottom peg.

Set the clamp at B = 20 mm (25/32") from the edge of the tube and tighten it.

Tighten the ball joint until it is free without play, on its seat, using wrench B.Vi.315.

Tighten the locknut.

Check that the selector lever works satisfactorily in all positions. No hard spots should be apparent, the lever should freely return towards the instrument panel, especially in "P" and "N" positions.



If it does not, check:

- the plastic gate
- the universal joint
- and alignment of the brackets.

Adjusting



Adjusting the lower part of the control

Selector lever:

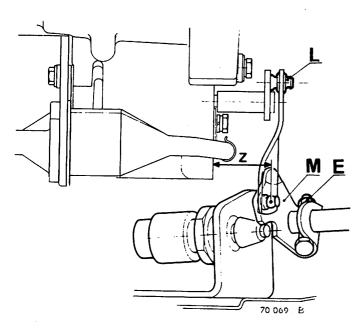
"Park" pointing downwards

Place the selector lever in the "automatic" position (A or D).

Line up engagement shaft (L) to the "automatic" position (A or D).

Selector lever:

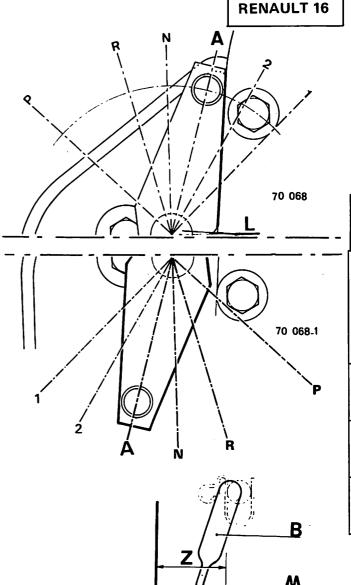
"Park" pointing downwards



With nut (E) unscrewed, press the link without strain onto engagement shaft (L) and lever ball joint (M) (link B for R.H.D.).

Bring the centre of lever ball joint (M) approximately to measurement Z from the side of the housing.

Lever (M) must not be hammered or knocked as such action might lead to damage to the gate, universal joint and bushes.



z = 38 mm (1-1/2")L.H.D. "Park" pointing downwards Z = 45,5 mm (1-25/32")

72 182 . 2

R.H.D. "Park" pointing upwards z = 50 mm (1-31/32")

Tighten up locknut E.

Adjusting



RENAULT 16

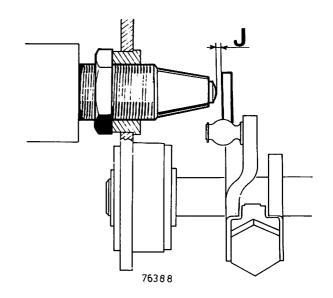
Adjusting the starter switch

Place the selector lever in "automatic" (A or D) position.

Unscrew the switch locknut. Screw the switch in or out to obtain the following clearance (J) (measured between the lever and the switch using a set of feeler gauges):

- selector lever starting: J = 0,3 mm (.012")
- ignition key starting: J = 1,75 mm (.069").

Tighten the locknut and check the clearance.

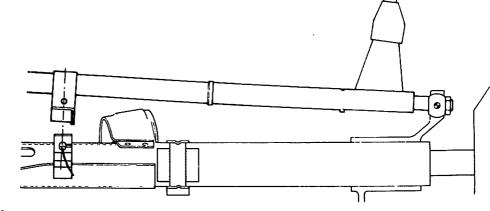


Adjusting the selector drum

The glove tray may have to be removed on R.H.D. vehicles.

Place the selector lever in "automatic" (A or D) position.

Unscrew the selector drum locking screw.



Position the selector drum:

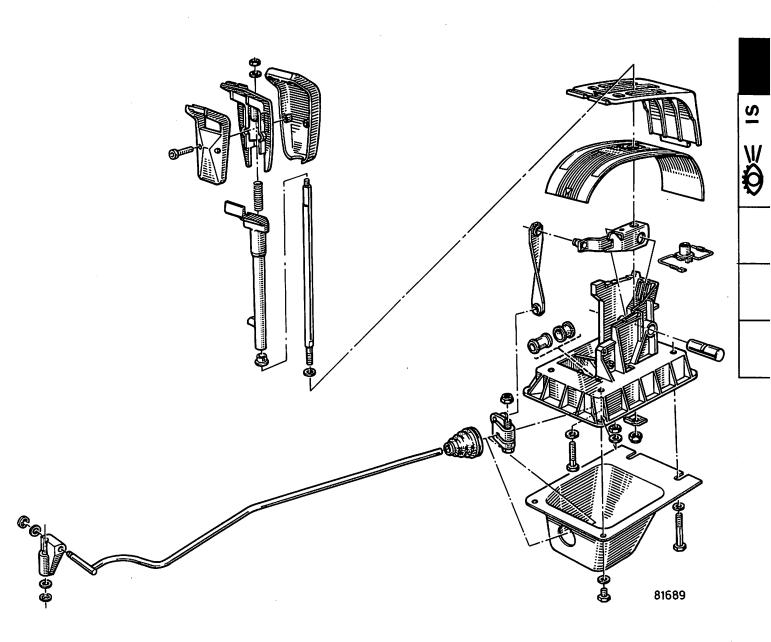
- the point where the cable is attached must be in line with the sleeve stop.

Move the selector repeater needle so that it corresponds to the gear engaged.

Tighten the drum fixing screw and refit the glove tray.



RENAULT 18





Removing - Refitting - Adjusting



RENAULT 18

REMOVING

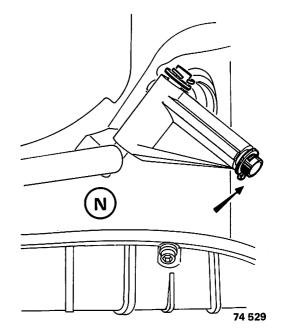
Place the selector lever in neutral (N).

Under the vehicle:

- Remove the circlip from the computer control arm.
- Remove cover.
- Unscrew the clevis and control rod bracket nuts.
- Disconnect the arm.

Inside the vehicle:

- Slide the selector gate out to remove.
- Remove the lever casing.



REFITTING AND ADJUSTING

Check that the computer is set in neutral (N) (4th. notch).

Fit the following to the rod:

- the bellows and cover
- the lever.

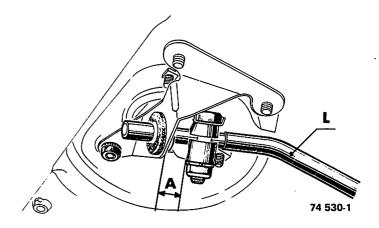
Insert the control rod in the bearing at the control end.

Connect the control rod at the transmission end.

Reconnect the arm.

Check dimension A = 15 mm (19/32") before torque tightening.

Offer up and fix the cover.





SOLENOID BALL VALVES

Incidents



4139

INCIDENTS WHICH MIGHT BE DUE TO THE SOLENOID BALL VALVES

4139-40-41-50

- Incorrect gear changing speeds.
- No 1st. gear in "Automatic"
- No 2nd. gear in "Automatic"
- No 3rd. gear in "Automatic"
- Remains in 3rd. gear.

4139 all types except 40-41-50

- Snatch during gear changing.
- Incorrect gear changing speeds.
- No 1st. gear in "Automatic"
- No 2nd. gear in "Automatic"
- No 3rd. gear in "Automatic"
- Remains in 3rd. gear.

STICKING BALL

All types of 4139 automatic transmission.

No 1st. gear in A but: 2 3 2 functioning EL1 remaining open

No 2nd. gear in A but: 1 3 1 functioning ELl remaining closed

3rd. gear only functioning

EL2 remaining open

No 3rd. gear but : 1 2 1 functioning EL2 remaining closed

DIAGNOSIS

(In the event of a sticking ball)

Connect up control box B.Vi.454-06 or B.Vi.797 or B.Vi.797-01.

Check the current at the ball valve solenoids.

If the current passing through the ball valve solenoids is normal and the ELl and EL2 warning lights function at the right moments this means that the electrical instructions are being given normally.

It must be remembered however that these instructions cannot be carried out if the solenoid ball valves are sticking.

Use the control box to obtain the gears. If one of the solenoid ball valves is faulty then the missing gear will not be obtained.

Furthermore, the ELl and EL2 warning lights should go out at approximately the speeds shown in the gear changing table when in the "Light throttle" (PL), "Full throttle" (PF) and "Full throttle" with kick-down" (KD) positions.

Codes 2207-2245

Removing - Refitting



4139

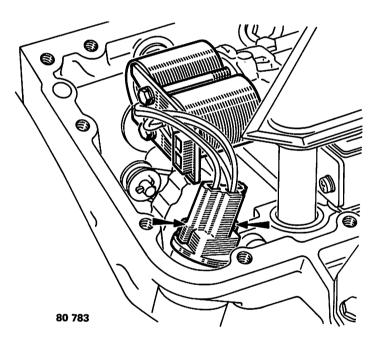
REMOVING

Drain the automatic transmission.

Remove the transmission sump and gasket.

Release the two retaining clips and remove the solenoid ball valve wiring plug.

Unscrew the two retaining plate bolts and remove the solenoid ball valves.



REFITTING

Take care not to cross the wires when refitting the solenoid ball valves (EL1: blue wire, EL2: white wire).

Refit the retaining plate.

Refit the plug to the sealed socket and make sure the clips are fastened.

Refit the sump using a new gasket and torque tighten the bolts.

Refit the transmission shield.

Refill the transmission with about 3 litres (5½ Imp. pts.) of ELF RENAULTMATIC D2 or MOBIL ATF 220 oil, check the level in the recommended fashion and top up as necessary.



VACUUM CAPSULE OIL PRESSURE

Incidents



INCIDENTS WHICH MIGHT BE DUE TO THE CAPSULE OR INCORRECT OIL PRESSURE

- Engine stalls, uneven idling (except Renault 5).
- Slip on starting off in "A" or "R".
- Slip during gear changing.
- Snatch during gear changing.
- Smoke from exhaust (except Renault 5).

Code	2223

CHECKING THE OIL PRESSURE

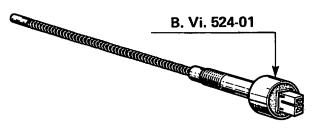
SPECIAL TOOLS

Methods reference	Description	Essential	Useful	Specifically for vehicle
B. Vi. 524-01	Temperature sensor			
B. Vi. 466-04	Oil pressure testing gauge		,	
B. Vi. 536	Screwdriver (R12-15-17-18)			

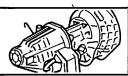
Oil pressure checks are carried out using the above gauge after making sure first of all that the vacuum capsule and vacuum circuit are sound.

The oil temperature must be 80°C when the check is carried out while driving in the "Full throttle" (PF) position.

The temperature is measured by means of the sensor B.Vi.524-Ol.



71115



Checking the oil pressure



4139

Temperature influence

The controlled oil pressure varies with the oil temperature. It is normal therefore to find pressures higher than those given below when the oil temperature is below 80°C.

The check is carried out in 2 stages:

- 1 pre-adjustment in Workshops
- 2 final check and adjustment while driving along in "Full throttle" (PF) position.
- 1 Pre-adjustment in Workshops
 - Disconnect vacuum capsule
 - Connect pressure testing gauge B.Vi.466-04 (arrow).
- Top up the transmission oil.
- Apply the handbrake and block the roadwheels (in front and behind).
- Connect a rev. counter.
- a Checking high pressure ("Park")
 Place the selector lever in
 "Park" (P).

At 800 r.p.m., the oil pressure should be at least 4 bars (57 psi); from then on in should rise rapidly as the accelerator is pressed until it reaches its maximum of 13 to 14 bars (185 to 199 psi).

b - Checking the "Light throttle" (PL)
 pressure

Place the selector lever in "N".

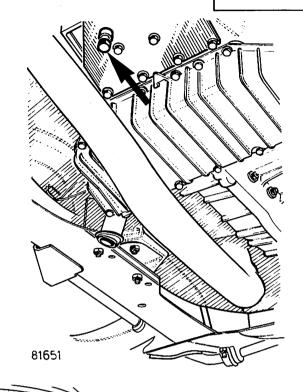
Run engine at 800 r.p.m.

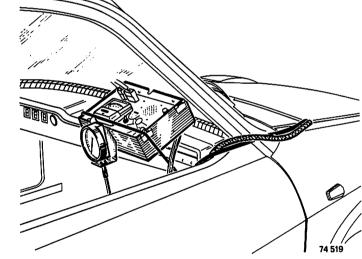
"Light throttle" pressure =

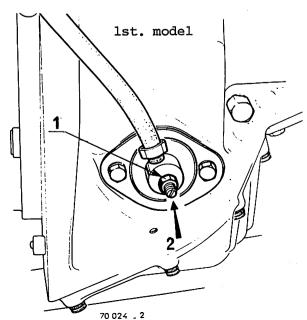
2,45 to 2,7 bars (34.84 to 38.4 psi) (except Renault 5)

"Light throttle" pressure = 2,9 to 3,1 bars (41.24 to 44.09 psi) (Renault 5)

Adjust the pressure at the capsule if necessary.







Checking the oil pressure

2nd. model

c - Pre-adjustment

Place the selector lever in "N".

Run engine at 3800 r.p.m.

The pressure read off the gauge should be close to the "Full throttle" (PF) pressure (see page 15).

Turn centre screw (2) in the vacuum capsule (except for 4139-41) to adjust the oil pressure.

Loosen locknut (1), then screw in screw (2) to increase the pressure or unscrew it to reduce pressure.

l complete turn of the screw alters the pressure by about 0,1 bar $(l^{\frac{1}{2}} psi)$ (1st. model).

1 complete turn of the screw alters the pressure by about 0,2 to 0,3 bars (2.84 to 4.26 psi) (2nd. model).

Use tool B.Vi.536 on the Renault 12,15,17 and 18.

This must be followed by a check and readjustment while driving along with the transmission oil temperature at 80°C.

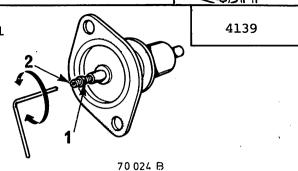
Note: The hydraulic distributor must be removed to adjust the Renault 5 without capsule (4139-41).

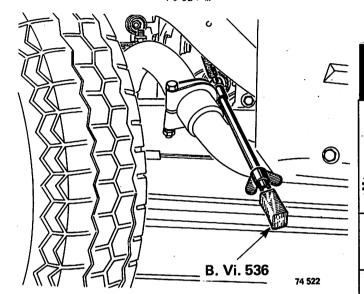
- 2 Checking the "Full throttle" (PF)
 pressure while driving along.
- Reconnect the vacuum capsule.
- Drive a few miles to warm the transmission oil up to 80°C.
- Place the selector lever in "A".
- Press accelerator pedal to floor.
- Read off the maximum oil pressure just before the 1 2 gear change.

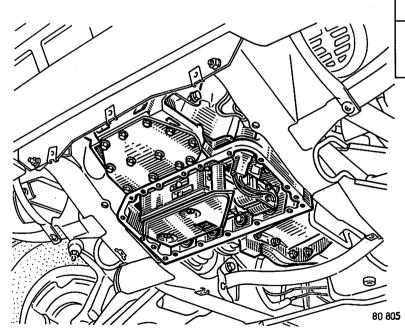
If the oil pressure is incorrect, check the capsule and vacuum circuit.

Change the capsule if necessary and adjust thee "Full throttle" (PF) pressure.

If the pressure is still incorrect, the pressure regulator or transmission is the cause.







Too low a pressure leads to considerable slip during gear changing, overheating of the clutches and brakes and consequent wear.

Too high a pressure leads to harsh gear changing and snatching which is uncomfortable for the occupants and harmful to the transmission.

Calibrate the pressure testing gauge frequently, particularly in the 4 bars zone and whenever the instrument has received a knock.

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Removing - Refitting



4139 EXCEPT 4139-41

REMOVING

Drain the automatic transmission.

Disconnect the vacuum hose.

Unscrew the 2 bolts and remove the capsule.

REFITTING

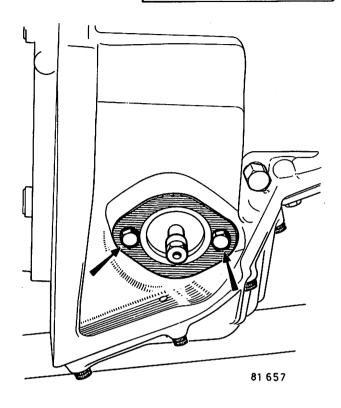
The capsule cannot be taken apart and must be changed if faulty.

Always fit a new seal smeared with "Perfect-Seal" or equivalent.

Fit the capsule and connect the vacuum hose.

Top up the transmission with ELF RENAULTMATIC D2 or MOBIL ATF 220 oil. (see chapter "Maintenance").

Make a pressure pre-adjustment and finalize in workshops or on a road test.



CHECKING THE CAPSULE

Checking with a vacuum gauge

The vacuum capsule is checked with the engine stopped.

Connect the vacuum gauge to the vacuum pipe.

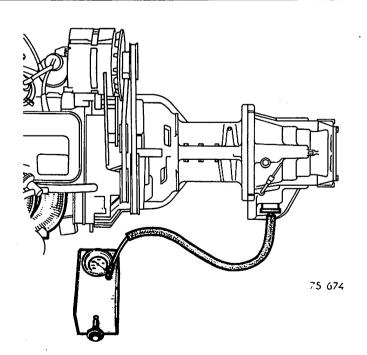
Apply a vacuum pressure of about 526 mbar (400 mm/Hg) to the capsule.

If the needle remains stationary, carry on with the pressure check ("Full throttle" (PF) and "Light throttle" (PL).

If, on the other hand, the needle falls, the capsule or its hose must be changed.

Also make sure that the union on the inlet manifold is serviceable.

Check that the hose is tight on the capsule and on the union.



An air leak into the capsule or hose will cause whistling, uneven idling, too high a "Light throttle" (PL) pressure and rather harsh gear changing under light load.

Removing - Refitting - Adjusting



4139 automatic transmission - all types except 40-41-50

INCIDENTS WHICH MIGHT BE DUE TO THE GOVERNOR

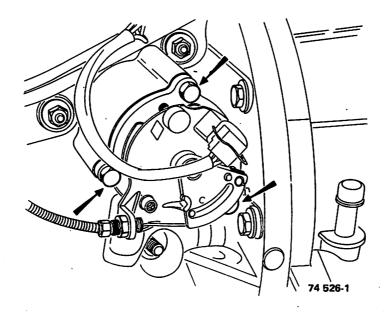
- Incorrect gear changing speeds.
- No 3rd. gear in automatic.
- Remains in 1st. gear in automatic.

REMOVING

Disconnect the battery.

Disconnect the governor cable and feed wires.

Unscrew the mounting bolts, and pull the governor out to free it.



REFITTING

If difficulty is experienced in sliding the governor back into position, turn the speedometer gear slowly at the same time.

Make sure the governor cable sleeve is in both stops and adjust the cable.

Check that the governor plug is secure and that both clips are tight.



Removing - Refitting - Adjusting

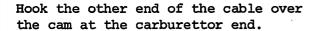


4139 automatic transmission except 40-41-50

ADJUSTING

Adjust sleeve stop (G) (governor end) to halfway along the thread.

Fit the governor cable to control quadrant (S).

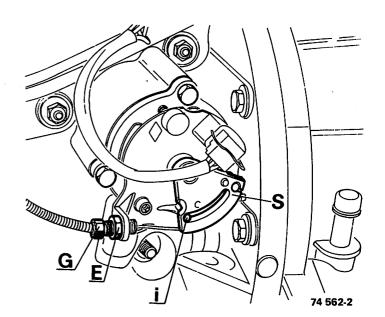


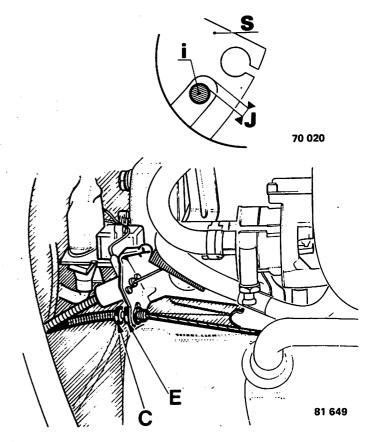
Press the accelerator right down and tension the cable by moving sleeve stop (C): in this way the cable is adjusted with nil play.

Now screw up sleeve stop (C) to obtain the correct amount of play.

Clearance (J) between quadrant (S) and peg (I) should be about 0,3 mm to 0,5 mm (.012 to .020") after adjusting the cable (check the amount of play in the sleeve).

Finish by tightening locknuts (E).





Removing - Refitting - Adjusting



4139 automatic transmission - all types except 40-41-50

INCIDENTS WHICH MAY BE DUE TO THE COMPUTER

- Incorrect gear changing speeds.
- No 1st. gear in automatic.
- No 2nd. gear in automatic.
- No 3rd. gear in automatic.
- No lst. gear "Hold".
- No 2nd. gear "Hold".
- Remains in 1st. gear in automatic.
- Remains in 3rd. gear.

REMOVING

Disconnect the harness and the computer connector bracket.

REFITTING

Turn the centre shaft to maximum position which corresponds to lst. gear "Hold".

Set lever (L) from the transmission in the lst. gear "Hold" position.

Offer up the computer with new spacers and hand tighten the bolts only at this stage.

ADJUSTING

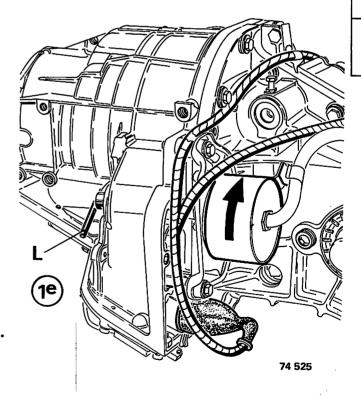
Turn the centre shaft to the maximum position which corresponds to 1st. gear "Hold".

Set lever (L) from the transmission in the lst. gear "Hold" position.

Without forcing, turn lever (L) and the computer together in the direction of the arrow up to the stop. This is essential in order to line up the manual valve correctly.

Moderately tighten the bolts without squashing the plastic spacers.

After checking that all the terminals are secure in the 2 connectors, reconnect the wires.



Removing - Refitting - Adjusting



4139 automatic transmission 40-41-50

INCIDENTS WHICH MAY BE DUE TO THE GOVERNOR-COMPUTER

- Incorrect gear changing speeds.
- No 3rd. gear in automatic.
- No 1st. gear "Hold".
- Remains in 1st. gear automatic.
- Remains in 3rd. gear.

ADJUSTING THE CABLE

At the governor-computer end.

Screw sleeve stop (G) fully in.

At the carburettor end

Press the accelerator right down and tension the cable by turning sleeve stop nut (C) to bring quadrant (S) up to its stop.

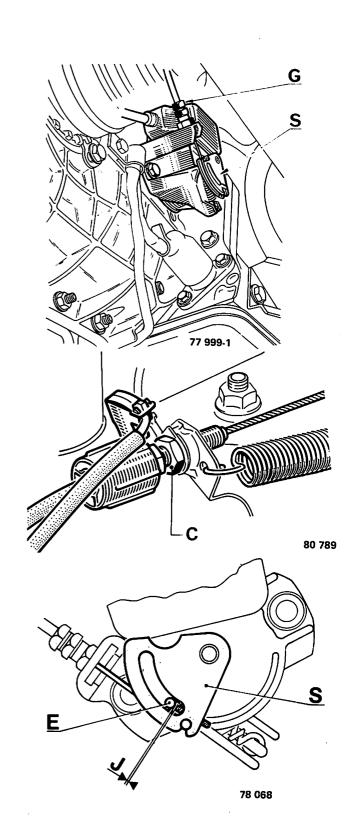
Tighten sleeve stop (C).

At the governor-computer end

Slacken off sleeve stop (G) to obtain a clearance (J) between quadrant (S) and stop peg (E) while the throttle butterfly is in "Full throttle" (PF) position.

J = 0.3 to 0.5 mm (.012 to .020").

Torque tighten the locknut.





GOVERNOR-COMPUTER

Removing - Refitting



4139-40-41-50

REMOVING

Remove the expansion bottle first to make it easier to remove the governor-computer.

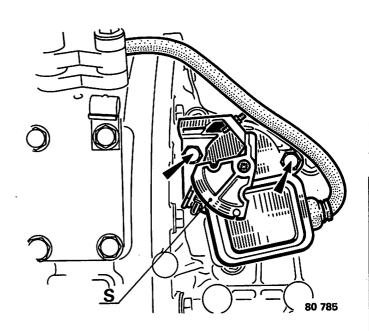
Disconnect the governor cable from quadrant (S).

Remove both bolts holding the governor-computer.

Disconnect the bridge piece and junction block.

Remove the 2 harness fixing bolts.

Remove the governor-computer assembly with its harness.



REFITTING

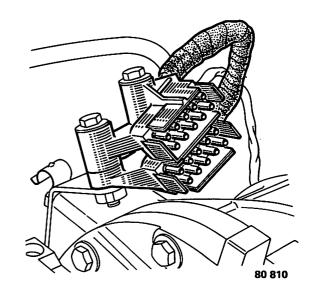
Offer up the governor-computer and fix it with the 2 bolts (Make sure that the seal is in position).

Assemble both junction blocks and fix them.

Connect the bridge piece and reconnect the harnesses.

Reconnect the governor cable and adjust it (refer to chapter "Adjustment").

Refit the expansion bottle.



MULTI-FUNCTION SWITCH

Incidents - Wiring diagram

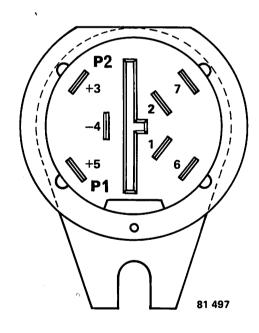


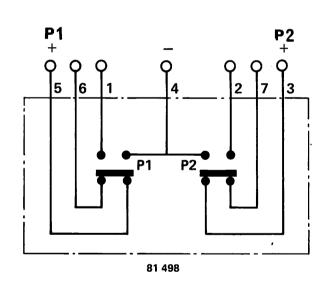
4139-40-41-50

INCIDENTS WHICH MIGHT BE DUE TO THE MULTI-FUNCTION SWITCH

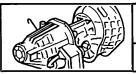
- Incorrect gear changing speeds
- No lst. gear "Hold"
- No 2nd. gear "Hold"
- Starter not working
- Reversing lights not working
- No 1st. gear in automatic
- No 2nd. gear in automatic

WIRING DIAGRAM





- 1 1st. gear "Hold"
- 2 Solenoid ball valve (EL2)
- 3 Reversing light + (P2)
- 4 Earth
- 5 Starter + (P1)
- 6 Starter
- 7 Reversing light



MULTI-FUNCTION SWITCH

Switch functions



4139 - 40 - 41 - 50

SELECTOR LEVER POSITION	Pl Plunger - STARTING	P2 PLUNGER - REVERSING LIGHT
Р	1	0
R	0	. 1
N	1	. 0
A - 2 - 1 -	0	0

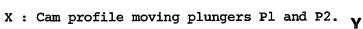
1 - Contact should be made

O - Contact should not be made

Example:

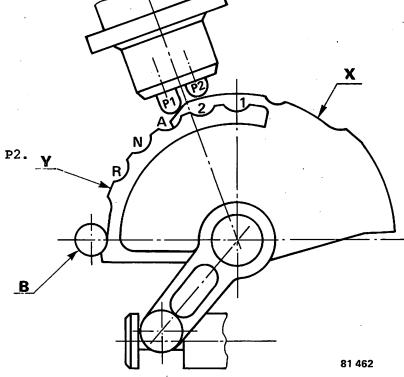
- In "P" : Pl makes contact

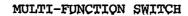
P2 does not make contact.

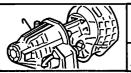


Y : Cam profile for detent ball.

B : Locating ball.







Code 2101

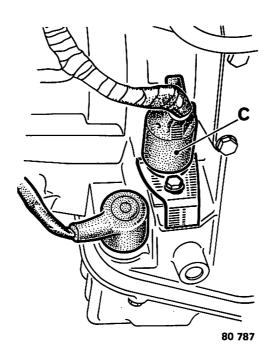
Removing - Refitting



4139 - 40 - 41 - 50

REMOVING

Remove connector (C) from the multi-function switch.



Unscrew the bolt holding the multi-function switch retaining plate and remove the switch.

REFITTING

Refit the multi-function switch, fasten the retaining plate and refit the connector.



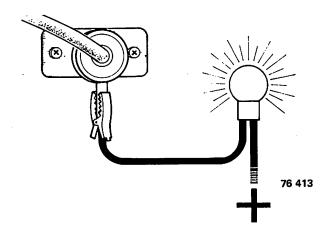
Checking



4139

The operation of the kick-down switch is checked by connecting a test bulb between the switch and battery + post or by using the control box during a general check.

The test bulb or control box warning light will illuminate, indicating that the circuit is sound, when the accelerator is pressed right down.



Code 2210

Removing - Refitting - Adjusting

INCIDENTS WHICH MAY BE DUE TO THE KICK-DOWN SWITCH

- Incorrect gear changing speeds.

REMOVING

The kick-down switch is not integral with the accelerator cable.

Remove the accelerator cable.

Disconnect the wire from the switch.

Remove the 2 screws and take off the kick-down switch.

ADJUSTING

The accelerator cable is used for adjustment.

Make sure that the accelerator cable has sufficient initial play to allow 3 to 4 mm (1/8 to 5/32") of movement of stop sleeve (B) when the accelerator is pressed hard down.

Make sure that the cover in in position to prevent tarnishing of the contacts.

The travel of the accelerator pedal, the kick-down switch setting and governor cable adjustment are all closely related; they must be checked and adjusted together.

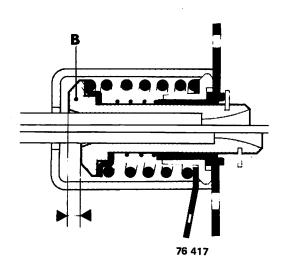
REFITTING

Refit the kick-down switch.

Reconnect the wire.

Re-attach the accelerator cable.

Adjust the cable and switch action.



107





4139 ALL TYPES EXCEPT 40-41-50

INCIDENTS WHICH MAY BE DUE TO THE HYDRAULIC DISTRIBUTOR

- Slip during gear changing.
- Snatch during gear changing.
- Incorrect gear changing speeds.
- No drive in "R" nor 3rd.
- No reverse nor engine braking in 1st. gear "Hold".
- No 2nd. gear in automatic.
- No 3rd. gear in automatic.
- Remains in 1st. automatic.
- Remains in 3rd.

Code 2225

Removing - Refitting

TIGHTENING TORQUES

Distributor fixing bolts 0,7 m. da N (51b/ft)

Cover fixing bolts

0,8 m. da N (61b/ft)

REMOVING

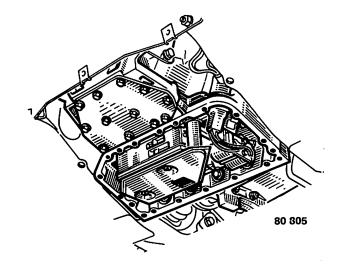
THE HYDRAULIC DISTRIBUTOR MAY BE REMOVED WHILE THE TRANSMISSION IS IN SITU.

Drain the transmission oil.

Remove:

- the transmission sump and gasket.
- the pump suction gauze and gasket.

Remove the oil pump suction pipe seal.





Removing - Refitting

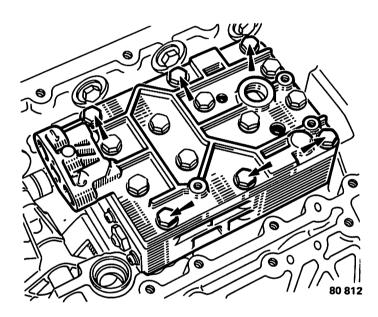


4139 ALL TYPES EXCEPT 40-41-50

Disconnect the plug from the sealed socket.

Remove the solenoid ball valves.

Remove the hydraulic distributor.
Warning: Unscrew only those bolts marked below with an arrow.



REFITTING

Refit the hydraulic distributor.

Torque tighten the 6 bolts.

Refit the solenoid ball valves and reconnect the plug to the sealed socket.

Refit the oil pump gauze and seal. (Make sure that the suction pipe has its seal in place).

Refit the cover using a new gasket.

Torque tighten the bolts.

Refit the transmission shield.

Pour in about 3 litres (5\frac{3}{4} Imp. pts.) of ELF RENAULTMATIC D2 or MOBIL ATF 220 oil.

Start the engine, check the level in the recommended manner and top up if necessary. (refer to chapter "Maintenance").

Check the oil pressure.



Incidents



4139 - 40 - 41 - 50

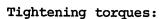
INCIDENTS WHICH MAY BE DUE TO THE HYDRAULIC DISTRIBUTOR

- Slip during gear changing.
- Incorrect gear changing speeds.
- No drive in "R" nor 3rd.
- No reverse nor engine braking in 1st. gear "Hold".
- No 2nd. gear in automatic

- No 3rd. gear in automatic.
- No lst. gear "Hold".
- Remains in 1st. gear automatic.
- Remains in 3rd.

Code 2225

Removing - Refitting



Distributor fixing bolts

0,7 m. da N

(51b/ft)

Cover fixing bolts

0,8 m. da N

(61b/ft)

REMOVING

THE HYDRAULIC DISTRIBUTOR MAY BE REMOVED WHILE THE TRANSMISSION IS IN SITU

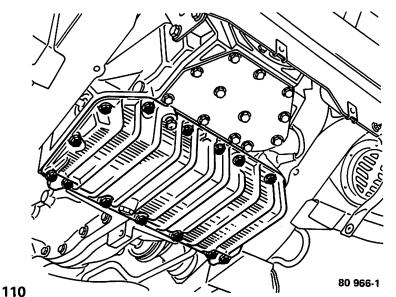
Drain the transmission oil.

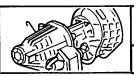
Remove the transmission shield.

80 967

Remove:

- the transmission sump and its gasket.





Removing - Refitting



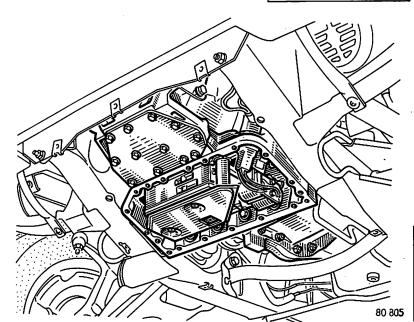
4139 - 40 - 41 - 50

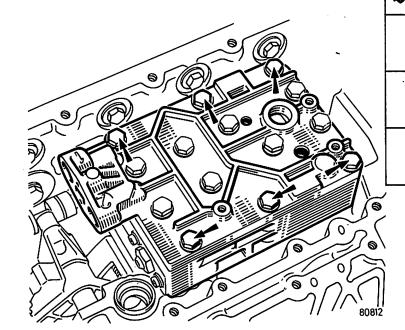
the oil pump suction gauze and its gasket.

Remove the suction pipe seal.

Disconnect the plug from the sealed socket.

Remove the solenoid ball valves.





Remove the hydraulic distributor.

Warning: Remove only the bolts marked on the right with an arrow.

REFITTING

Refit the hydraulic distributor.

Torque tighten the 6 bolts.

Refit the solenoid ball valves and refit the plug to the sealed socket.

Refit the gauze and its gasket. (Make sure that the suction pipe seal is in its place).

Refit the transmission sump using a new gasket.

Torque tighten the bolts.

Pour in about 3 litres of ELF RENAULTMATIC D2 or MOBIL ATF 220 oil.

Start the engine, check the level in the recommended manner and top up if necessary.

(Refer to chapter "Maintenance").

Check the oil pressure.



Incidents



4139

INCIDENTS WHICH MAY BE DUE TO THE CONVERTER

- Excessive "Creep" in "A".
- Slip on starting off in "A" or "R".
- No drive in "A", nor in 1st. gear "Hold" nor "R".

Code 2228

Removing - Refitting



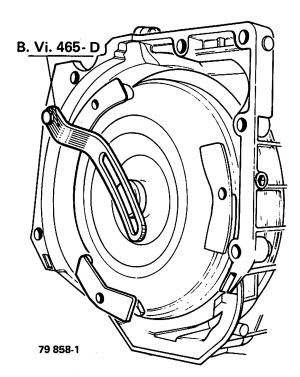
The automatic transmission must be removed for this operation.

Remove retaining plate B.Vi.465 mark D holding the converter temporarily.

Pull the converter towards you and lift it off.

Check the condition of:

- the converter locating ball (crankshaft end)
- oil seal bearing surface
- converter white metal sleeve and freewheel
- cooling slats
- and the three securing points.



REFITTING

It is advisable to hold the transmission vertical in order to make the operation easier when refitting the converter.

Fit the converter retaining plate.

Protect the joint face with a plastic sleeve when handling the converter.







OIL SEAL

Code 2230 Removing - Refitting

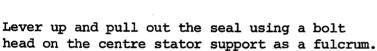


4139

The automatic transmission must be removed for this operation.

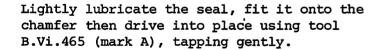
Remove the converter first then extract the oil seal using tool B.Vi.465 mark C.

Use a burr-free tool so as not to damage the housing bore.



Check the condition of the smooth part of the centre stator support.

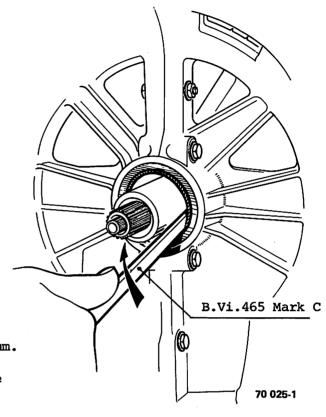
Then fit the new oil seal.

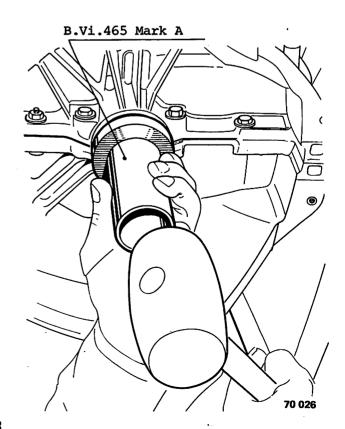


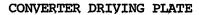
This tool automatically sets the depth of the seal.

Lubricate the joint face with recommended oil and refit the converter.

Fit the retaining plate.









Incidents - Checking



4139

INCIDENTS WHICH MAY BE DUE TO THE DRIVING PLATE

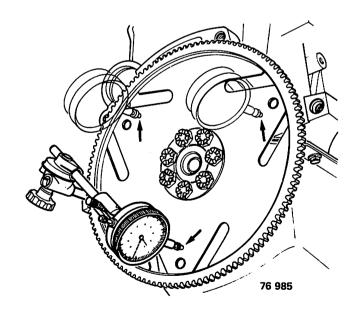
- No drive in "A", nor in 1st. gear "Hold" nor "R".

CHECKING

The automatic transmission must be removed for this operation.

Arrange a clock gauge and bracket to obtain a reading near each converter fixing hole.

Compare the readings: Max. permissible run-out 0,3 mm (.012").



114



Code 2229

Removing - Refitting



SPECIAL TOOLS

4139

Methods Reference	Description	Essential	Useful	Specifically for vehicle
Mot. 582	Locking sector			
Mot. 50	Torque wrench			

TIGHTENING TORQUES

Driving plate fixing bolts: 6,5 to 7 m. da N (50 to $52\frac{1}{2}$ lb/ft)

DO NOT USE A SCREWDRIVER OR BAR INSERTED IN AN APERTURE TO PREVENT THE PLATE FROM TURNING. PLATE DISTORTION MAY RESULT.

REMOVING

Fit locking sector Mot.582 to prevent the driving plate from turning.

Unscrew the 7 fixing bolts round the centre.

Remove the driving plate.

Discard these bolts; they must not be re-used.

Mot. 582

REFITTING

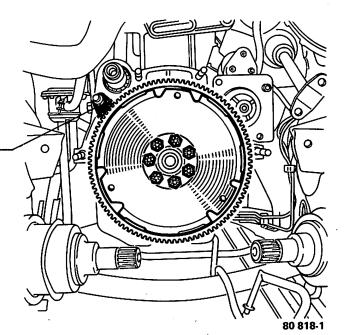
Fit:

- the sandblasted washer (crankshaft side)
- driving plate
- and washer.

Secure the plate with 7 new self-locking bolts.

Fit locking sector Mot.582 and torque tighten the bolts.

Remove the locking sector.





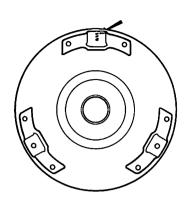
Identification

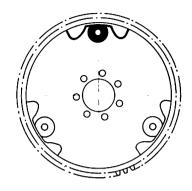


Converter

R 1225

Driving plate





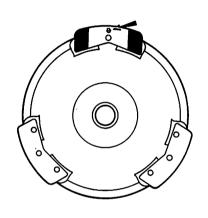
82 890

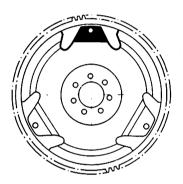
R 1153 - 1154 - 1155 - 1156

82 855

82 854

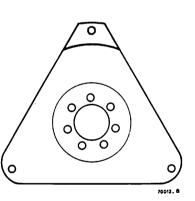






82 891

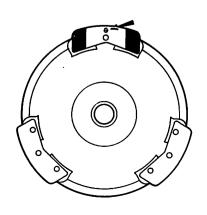
- 4139 - 00 - 01 - 02 - 10 - 11 - 12 -

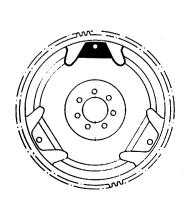




82 989

4139 - 03 - 04 - 05 - 06 - 07 - 08 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 -

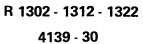




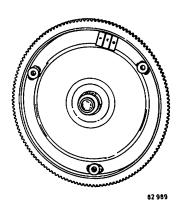


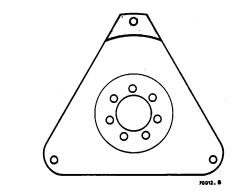
Identification

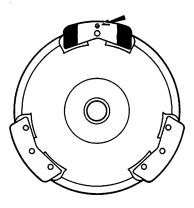
Converter



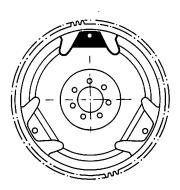
Driving plate



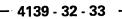


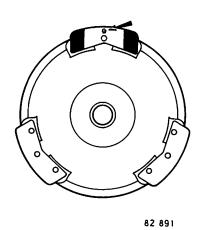


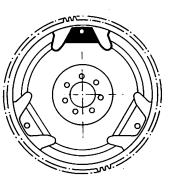




82 854







82 854



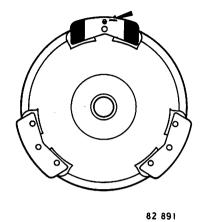
Identification

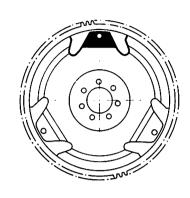


Converter

R 1318 - 1328

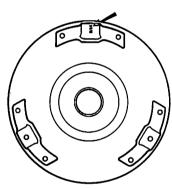
Driving plate

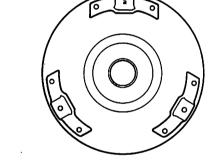




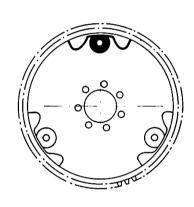
R 1340

82854



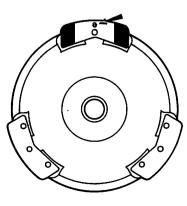


82 890

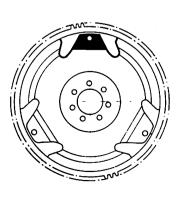


---- R 1341 - R 1351 -----

82 855



82 891



82 854

Code 2055

Removing - Refitting



RENAULT 5

SPECIAL TOOLS

Methods reference	Description	Essential	Useful	Specifically for vehicle
Mot 50	Torque wrench			
T. Av. 476	Ball joint extractor			
3.Vi.807	Ring nut wrench			

TIGHTENING TORQUES

Roadwheel nuts	5	to 6	m.da 1	N (.	37-2	to	45	lb/ft)
Suspension top ball joint nu	ıt	3,5	m.da 1	N (26			lb/ft)
Steering arm ball joint nut		3,5	m.da 1	N (26			lb/ft)
Girling brake calliper guide	e bolts 3,4	to 3,8	m.da 1	N (:	25½	to	28	lb/ft)

Differential ring nuts may be removed while the transmission is in situ

REMOVING

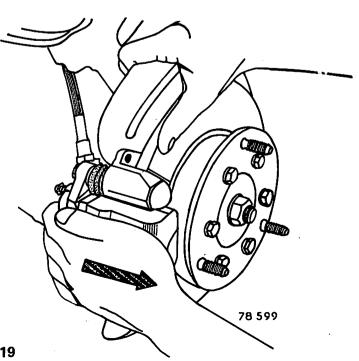
Drain the oil from the automatic transmission.

Loosen the front roadwheel nuts.

Place the front of the vehicle on stands.

Remove:

- the front wheels,
- and brake callipers (without disconnecting the hoses). Push the piston in by sliding the calliper outwards.



Removing

Remove the calliper guide bolts using two wrenches.

Do not clean these bolts.

Remove the sliding calliper.

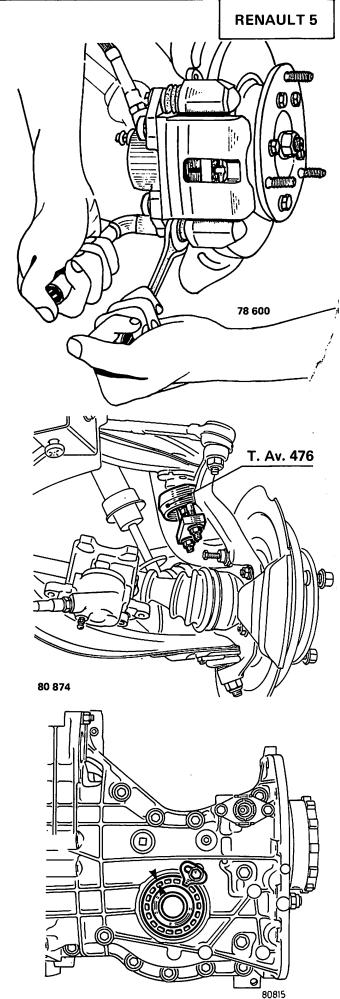
Remove the pad springs and pads.

Disconnect the suspension top ball joints using extractor T.Av.476.

Tilt the stub axle carrier at the same time freeing the drive shaft from its sunwheel.

Mark the position of the ring nut in relation to the casing.

Remove the lockplate.



Removing



Machine off the chamfer A on tool B.Vi.807 so that the o/d becomes 67 mm.

Unscrew the ring nut with this tool. Count the number of turns required to clear the threads completely.

REFITTING

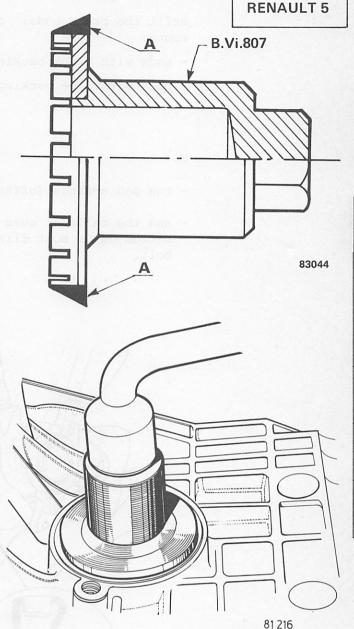
Change the ring nut oil seal.

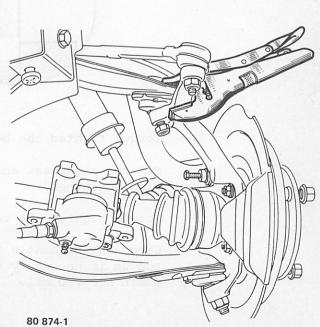
Refit the ring nut using tool B.Vi.807 again. Count the same number of turns noted on dismantling and line up the marks.

Refit the drive shaft.

Fit:

- the drive shafts in their sunwheels,
- and the ball joints to their stub axle carriers. Use a pair of vice grips to hold the ball joint taper firm while torque tightening the nut.





Refitting



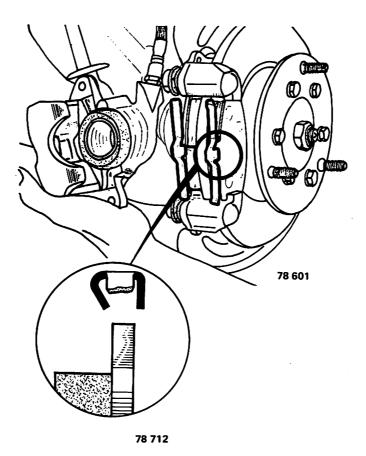
RENAULT 5

Refit the brake pads; fit them the correct way round:

- pads with black backing go INSIDE,
- pads with blue backing go OUTSIDE.

Fit:

- the pad springs (offset towards disc),
- and the calliper over the pads; fit the bottom guide bolt first then the top guide bolt.



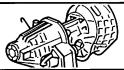
Torque tighten the bottom bolt first.

Fit the roadwheel and remove the stand on the side concerned.

Torque tighten the roadwheel nuts.

Check the automatic transmission oil level and top up if necessary with ELF RENAULTMATIC D2 or MOBIL ATF 220 oil.

DIFFERENTIAL RING NUT AND OIL SEAL



Code 2045

Removing - Refitting

RENAULT 12 - 15 - 17 - 16

SPECIAL TOOLS

Method reference	Description	Essential	Useful	Specifically for vehicle
Mot 50	Torque wrench			
T.Av.509- 01	Spacer legs			
B.Vi.31-01	Set of rollpin drifts 5 mm			
T.Av.476	Ball joint extractor			
B.Vi.807	Ring nut wrench			
B.Vi.377	Ring nut wrench			
B.Vi.553	Sleeve for changing differential ring nuts			

TIGHTENING TORQUES

Roadwheel nuts

6 to 8 m.da N (45 to 60 lb/ft)

Suspension top ball joint nut 5 m.da N (37½ lb/ft) (except Renault 16)

3,5 m.da N (26 lb/ft) (Renault 16)

Steering arm ball joint nut 3,5 m.da N (26 lb/ft)

These ring nuts may be removed while the transmission is in situ.



DIFFERENTIAL RING NUT AND OIL SEAL

Identification



RENAULT 12 - 15 - 17 - 16

There are 3 different patterns of differential ring nuts and oil seals.

lst. assembly	2nd. assembly	3rd. assembly
Ring nut with feltless seal	Ring nut with felt seal	Ring nut with "O"
75 875	75 876	82 837
Feltless oil seal	Oil seal with felt	Lip-type seal

76389





RENAULT 12 - 15 - 17 - 16

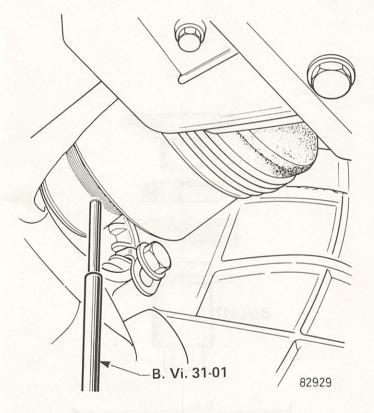


Drain the oil from the automatic transmission.

For Renault 12 - 15 - 17:

Insert spacer legs T.Av.509-Ol between the bottom suspension arm pins and the shock absorber bottom mounting pins.

For Renault 12 - 15 - 16 - 17:

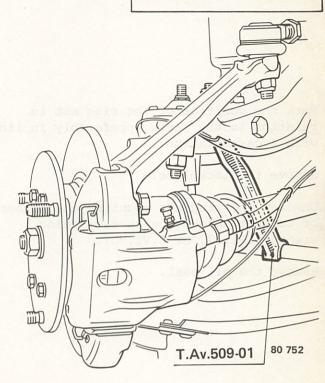


Free the following using extractor T.Av.476:

- steering arm ball joints
- and suspension top ball joints.

Tilt the stub axle carriers and free the drive shafts from their sunwheels at the same time.

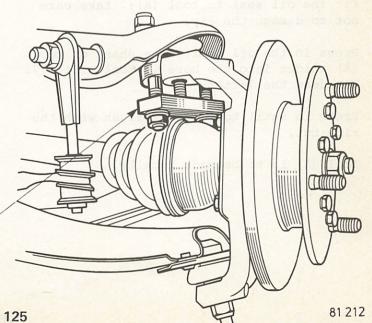
T. Av. 476



Place the vehicle so that the roadwheels hang free and check that spacer legs T.Av.509-Ol are firmly in position.

Punch the rollpins out of the drive shafts using drift B.Vi.31-Cl.

Remove the callipers and pads.



SI NO



Removing



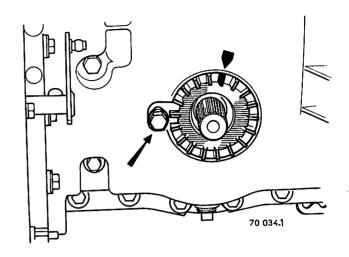
RENAULT 12 - 15 - 17 - 16

Mark the position of the ring nut in relation to the casing preferably in line with a castellation.

Remove the lockplate.

Unscrew the ring nut counting the number of turns to clear the threads using wrench B.Vi.377 or B.Vi.807.

Remove the oil seal.



REFITTING

Lubricate the oil seal to aid assembly.

Feltless oil seal (1st and 2nd assemblies).

The oil seal must butt against the ring nut flange.

Felt-type oil seal (2nd. assembly).

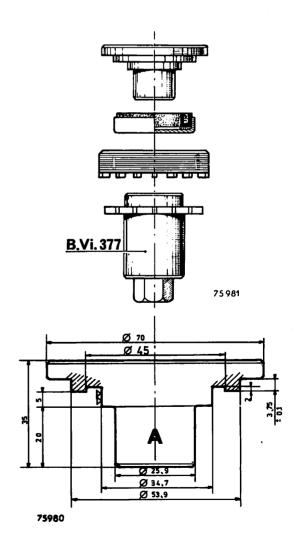
Fit the ring nut to tool B.Vi.377.

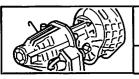
Fit the oil seal to tool (A): take care not to damage the lip.

Press in the oil seal: the shank on tool (A) slides into the bore in tool B.Vi.377. Withdraw the latter.

Press in until tool (A) is flush with the ring nut.

Tool (A) is to be made locally.





DIFFERENTIAL RING NUT AND OIL SEAL

Refitting



RENAULT 12 - 15 - 17 - 16

Degrease the threads in the ring nut and casing.

Smear the following with Perfect-Seal or equivalent:

- all the ring nut threads
- and the first 4 or 5 threads in the casing.

Screw the ring nut with its new oil seal into the casing using either wrench B.Vi.377 or B.Vi.807 by the number of turns noted on dismantling until the marks are in line.

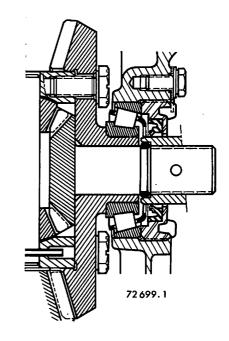
Secure the ring nut with its lockplate.

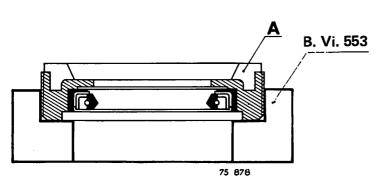
CHANGING A 1st. ASSEMBLY FELTLESS OIL SEAL FOR A 2nd. ASSEMBLY FELT-TYPE OIL SEAL

Certain precautions must be taken during re-assembly when an existing feltless oil seal is changed for one of the 2nd. assembly felt-type to ensure that:

- correct crown wheel and pinion backlash is retained
- the bearings turn freely without play.

A special tool B.Vi.553 has been made available which enables the initial position of the bearing to be found.

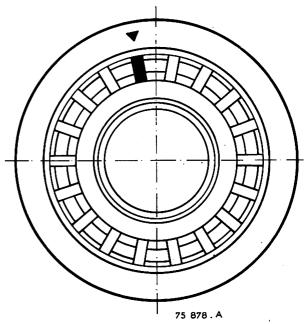




Screw removed ring nut (A) onto sleeve B.Vi.553 until it touches the shoulder; use wrench B.Vi.377.

Mark tool B.Vi.553 in line with the castellation on ring nut (A) marked earlier.

Unscrew ring nut (A).



Refitting

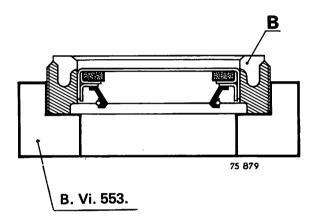


RENAULT 12 - 15 - 17 - 16

Select a ring nut with felt-type oil seal (B), screw it into the sleeve using wrench B.Vi.377 until it touches the shoulder (tighten the ring nut the same amount as previously).

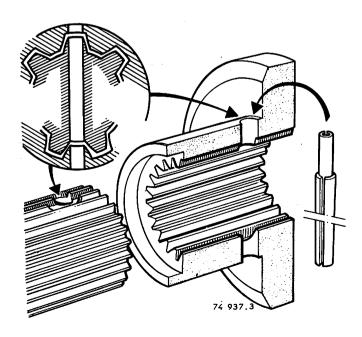
Transfer the mark made on the sleeve to ring nut (B) (this mark will be used when screwing the ring nut into the casing).

Unscrew ring nut (B).

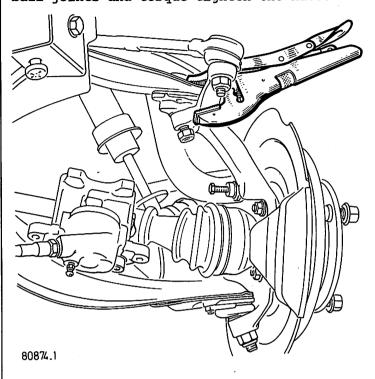


Position the drive shaft and tilt the stub axle carrier to align the rollpin holes.

Plug the holes after fitting the rollpins with Rhodorsil CAF 4.



Refit the steering arm and suspension top ball joints and torque tighten the nuts.



Refit the brake callipers.

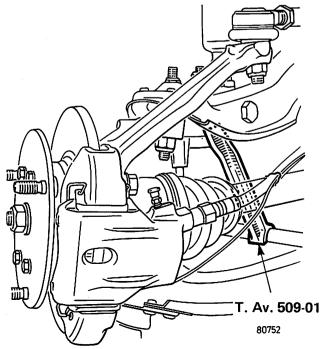
Refit the roadwheel.

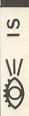
Remove the vehicle from the stands.

Remove the spacer legs T.Av.509-Ol on the Renault 12-15-17.

Top up the transmission with ELF RENAULTMATIC D2 or MOBIL ATF 220 oil.

Press the brake pedal several times to push the pistons up against the pads before using the vehicle.







Removing - Refitting



RENAULT 18

SPECIAL TOOLS

Methods Reference	Description	Essential	Useful	Specifically for vehicle
T. Av. 509-01	Spacer legs		, , 8320	d edit on trasi
B. Vi. 31-01	Set of rollpin drifts	nies a pillo	shaft	on constant
T. Av. 476	Ball joint extractor			
B. Vi. 807	Ring nut wrench			
B. Vi. 813	Differential ring nut oil seal protector			
Mot 50	Torque wrench			

TIGHTENING TORQUES

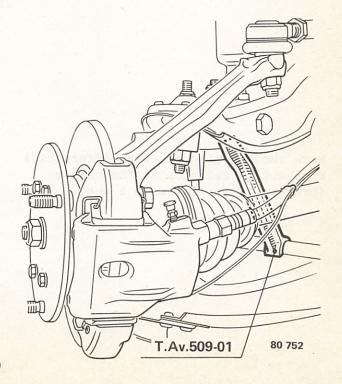
Steering arm ball joint 3,5 m. da N (26 lb/ft) Suspension top ball joint 5 m. da N $(37\frac{1}{2} \text{ lb/ft})$ Brake calliper guide bolts 3,5 m. da N (26 lb/ft) Roadwheel nuts 7 m. da N $(52\frac{1}{2} \text{ lb/ft})$

Ring nuts may be removed from the transmission while in situ.

REMOVING

Drain the oil from the automatic transmission.

Insert a spacer leg T.Av.509-Ol between each bottom suspension arm pivot pin and the shock absorber bottom mounting pin.



DIFFERENTIAL RING NUT AND OIL SEAL

Removing - Refitting

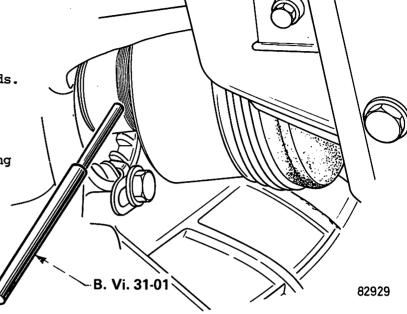


RENAULT 18

Place the front of the vehicle on stands.

Remove the brake callipers without disconnecting the hoses.

Punch out the drive shaft rollpins using drift B.Vi.31-Ol.

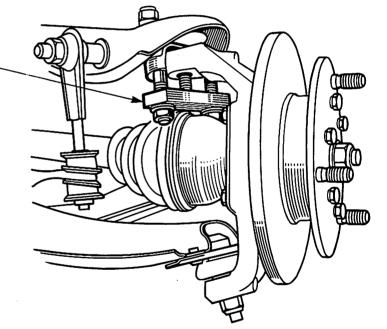


T. Av. 476-

Using extractor T.Av.476, separate:

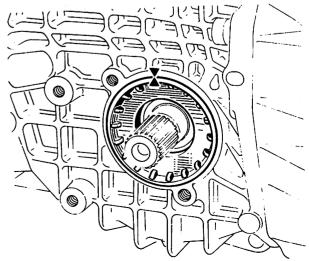
- the steering ball joints,
- and suspension top ball joints.

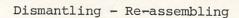
Tilt the stub axle carriers and withdraw the drive shafts from their sunwheels.



81 212

Mark the position of each differential ring nut in relation to the casing (preferably in line with a web).





RENAULT 18

DISMANTLING

Remove lockplate.

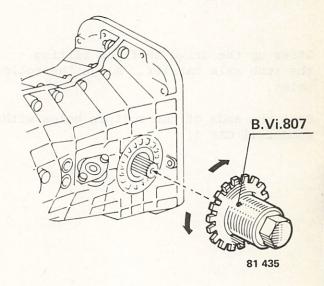
Unscrew the ring nut using wrench B.Vi.807. Count the number of turns required to clear the threads.

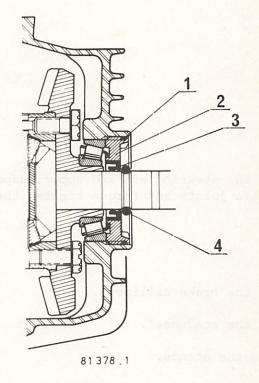
Remove oil seal.

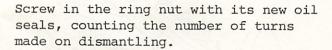


Change the lip-type oil seal (3) in ring nut (2) and 'O' ring (2) on the outside.

Fit protector B.Vi.813 over the sunwheel shaft to prevent the lip on oil seal (3) from being damaged.



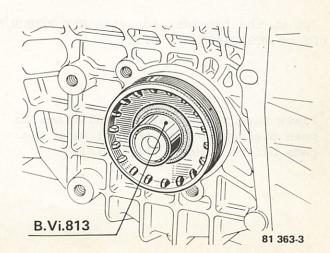




Fit the lockplate.

Remove the oil seal protector.

Fit 'O' ring (4) to the sunwheel shaft.

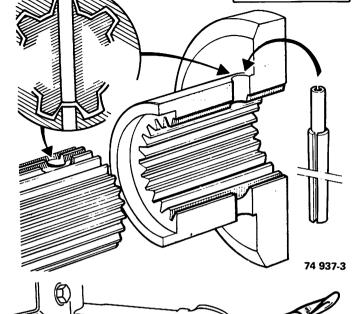


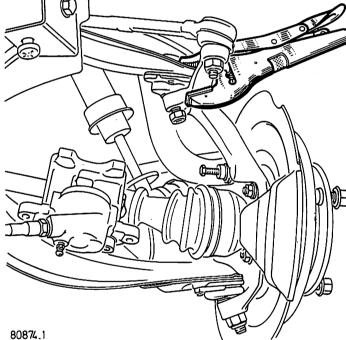
Dismantling - Re-assembling

RENAULT 18

Offer up the drive shaft by tilting the stub axle carrier. Align the rollpin holes.

Seal the ends of the rollpin holes with Rhodorsil CAF 4.





Refit the steering arm and upper suspension arm ball joints and torque tighten the nut.

Refit the brake callipers.

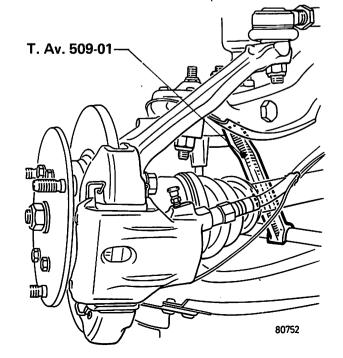
Refit the roadwheel.

Remove the stands.

Remove spacer legs T.Av.509-01.

Top up the transmission with ELF RENAULTMATIC D2 or MOBIL ATF 220 oil.

Press the brake pedal several times to push pistons up into contact with the pads before driving the vehicle.



Code 2227

Removing - Refitting



Methods Reference	Description	Essential	Useful	Specifically for vehicle
Mot 597	Lifting hook			
T. Av. 476	Ball joint			
B. Vi. 465D	Converter locking bar			
Mot.50	Torque wrench			
	•	ì		

TIGHTENING TORQUES

Roadwheels nuts

5 to 6 m. da N
(37½ to 45 lb/ft)

Suspension top ball joint nut

3,5 m. da N
(26 lb/ft)

Steering arm ball joint nut

3,5 m. da N
(26 lb/ft)

Converter fixing bolts

2,7 to 3,2 m. da N
(20½ to 24 lb/ft)

Brake calliper guide bolts

3,4 to 3,8 m. da N
(25½ to 28 lb/ft)

The automatic transmission may be removed:

- either with the engine from above using lifting hook Mot.597.
- or on its own from above using the same lifting hook.



Removing



RENAULT 5

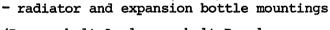
REMOVING

Disconnect the battery.

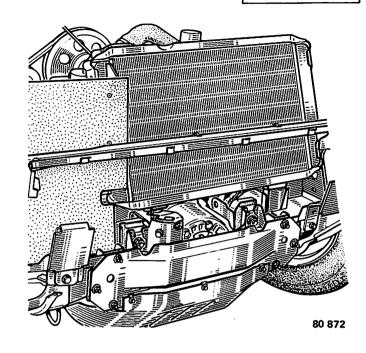
Drain the oil from the transmission.

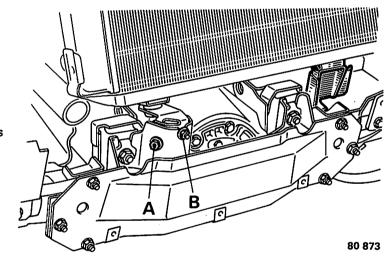
Remove:

- the transmission shield
- front direction indicator and sidelight assemblies
- front grille
- front shield
- headlights
- bonnet
- crossmember in front of radiator
- windscreen washer reservoir bracket
- radiator tie-rod.



(Remove bolt A, loosen bolt B only as there is a slot in the bracket).





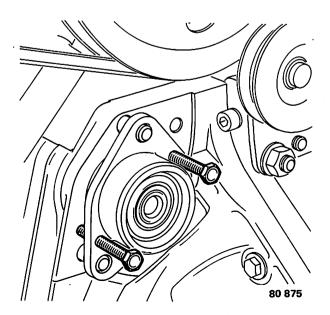
Raise and tilt the radiator-expansion bottle assembly over the engine.

Remove:

- camshaft pulley
- and camshaft bearing.

Disconnect:

- the harness between engine and automatic transmission
- the governor-computer cable
- and speedometer cable.







Removing



RENAULT 5

Loosen the front wheel nuts.

Place the front of the vehicle on stands.

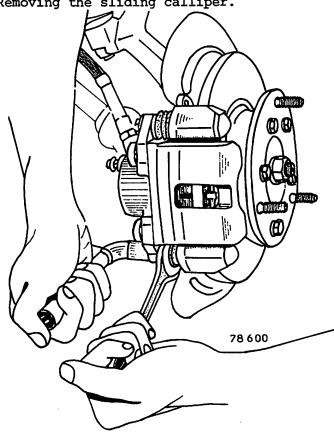
Remove:

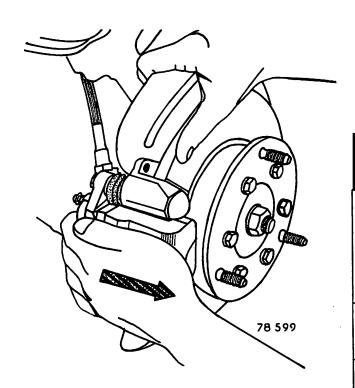
- the front wheels,
- and brake callipers (without disconnecting the hoses). Slide the callipers outwards by hand to push the piston back into its bore.

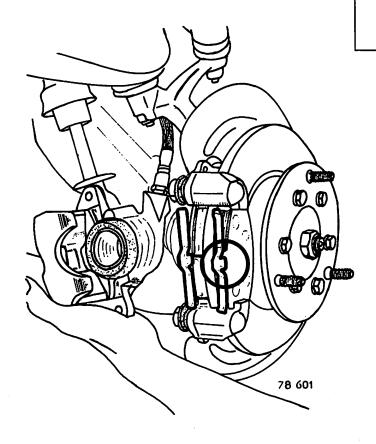
Remove the guide bolts using 2 wrenches.

Do not clean these bolts.

Removing the sliding calliper.

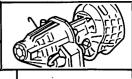






Remove the pad springs and pads.

Removing



RENAULT 5

Remove the steering box:

- mark the steering box height shims for identification,
- Remove rubber pad (1) between the flexible coupling and the steering wheel shaft.

Disconnect the automatic transmission selector control.

Disconnect the suspension top ball joints using extractor T.Av.576.

Tilt each stub axle carrier and withdraw the drive shaft from each sunwheel at the same time.

Remove:

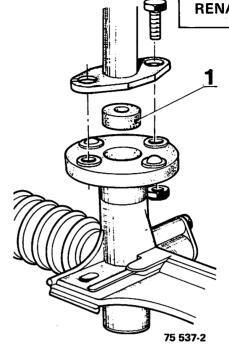
- the converter cover,
- disconnect the converter.

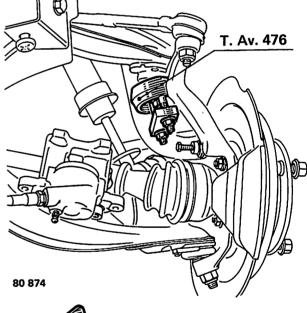
Fit lifting tackle Mot.597.

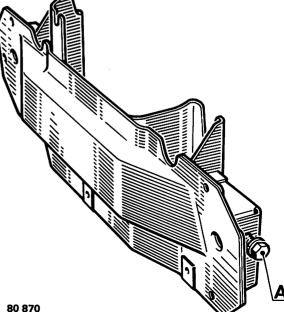
Remove the starter fixing bolts.

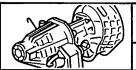
Remove the fixing bolts between engine and transmission.

Remove the front crossmember held by 6 bolts at the front and 1 bolt (A) through the L.H. sidemember.









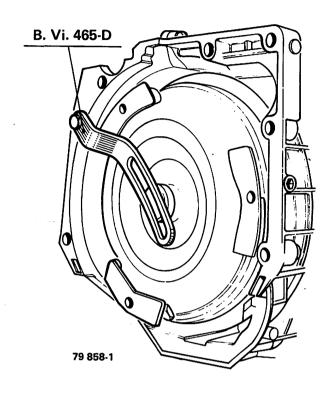
Removing



RENAULT 5

Remove the automatic transmission.

Fit retaining bar B.Vi.465, mark D over the converter as soon as the transmission has been removed.



Refitting

Note the following when refitting:

- Reconnecting the driving plate to the converter

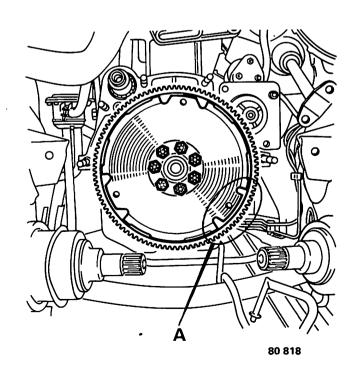
The mounting flanges at (A) differ.

The converter has 3 mounting bosses, one of which is aligned with the T.D.C. mark.

When re-assembling, line up the boss which has the T.D.C. mark at (A) to the flange which has the different cut-out pattern.

Screw in the converter fixing bolts gradually and alternately so that the unit is perfectly central.

Then torque tighten the bolts.



Refitting



RENAULT 5

- Refit the brake pads

The pads with BLACK backing fit INSIDE.

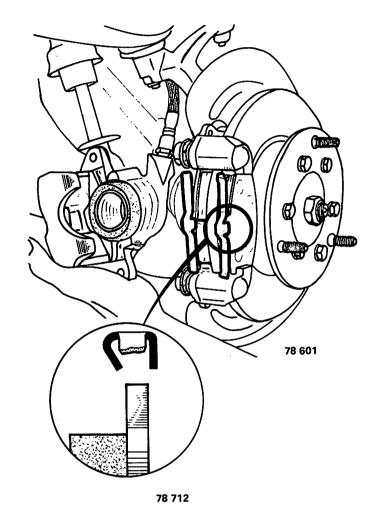
The pads with BLUE backing fit OUTSIDE.

Fit:

- the pad springs with centre offset facing the disc,
- and the callipers over the pads. Insert the bottom guide bolt first then the top guide bolt.

Torque tighten the bottom bolt first.

Press the brake pedal several times to push each piston into contact with its pads.



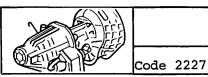
- Refit the steering box

Remember to refit the height setting shims correctly according to the marks made on dismantling (Right way up and correct side).

Adjust:

- the kick-down switch,
- governor,
- and selector control.

Refill with ELF RENAULTMATIC D2 or MOBIL ATF 220 oil.



Removing - Refitting



RENAULT 12 - 15 - 17 - 18

SPECIAL TOOLING

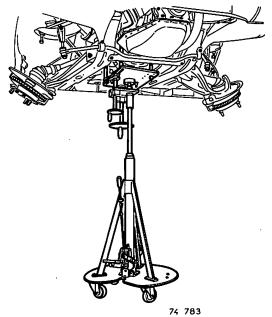
Methods reference	Description	Essential	Useful	Specifically for vehicle
Mot. 50	Torque wrench			
B. Vi. 31-01	Set of 5 mm rollpin drifts			
T. Av. 509-01	Front axle spacer legs			
T. Av. 476	Ball joint extractor			
B. Vi. 465-D	Retaining plate			

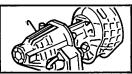
TIGHTENING TORQUES

Roadwheel nuts	6 to	8 (m.da N	(45	to	60	lb/ft)
Suspension top ball joint nu	t	5	m.da N	(37½			lb/ft)
Steering arm ball joint nut		3,5	m.da N	(26			lb/ft)
Converter fixing bolts	3 to	3,5	m.da N	(22½	to	26	lb/ft)

The automatic transmission may be removed:

- together with the engine from above.
- or on its own from below using the DESVIL 701 ST jack with 4 studs.





Removing



RENAULT 12 - 15 - 17 - 18

REMOVING

Disconnect battery.

Drain the automatic transmission oil.

Disconnect the vacuum capsule on the inlet manifold (except on R.1340).

On the R.1302 - 1312 - 1318 - 1322 - 1328: Remove the camshaft pulley.

All types.

Disconnect the transmission harness connectors and remove the bracket.

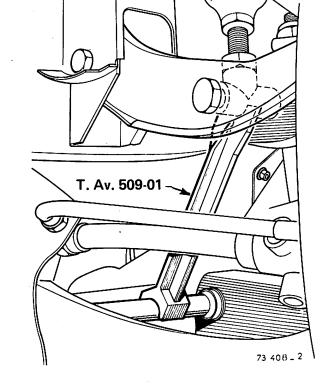
Insert spacer legs T.Av.509-Ol between the shock absorber lower fixing pins and the lower suspension arm pivot pins.

Place the front of the vehicle on stands.

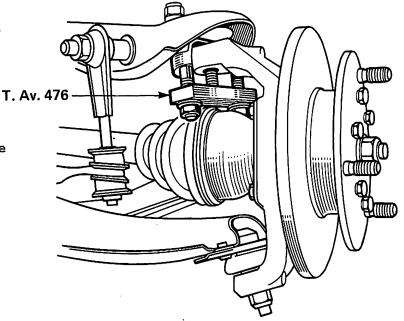
Punch out the drive shaft rollpins using drift B.Vi.31-Ol.

Remove the nuts from the following and separate using extractor T.Av.476:

- the steering arm ball joints
- and upper suspension arm ball joints.



Tilt the stub axle carriers, freeing the drive shafts from their sunwheels at the same time.



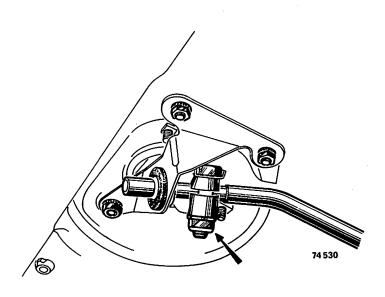
81 212

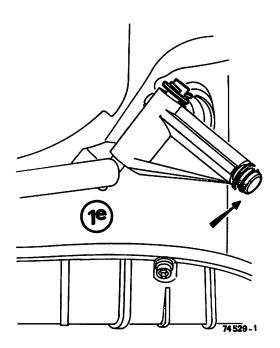


Removing



RENAULT 12 - 15 - 17 - 18





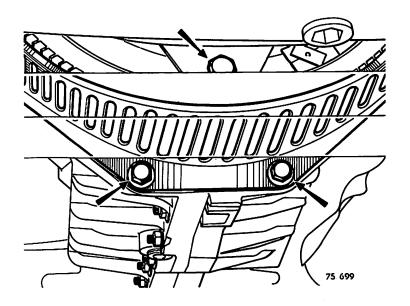
Disconnect the selector control; move the lever to 1st. gear "Hold" disconnect the rod at the computer unit and selector lever ends (unscrew the clamp) to do this.

Remove:

- the transmission dipstick tube
- and converter grille.

Disconnect converter (3 bolts).

Remove the silentbloc nut on the exhaust pipe, which is fixed to the transmission.



Removing

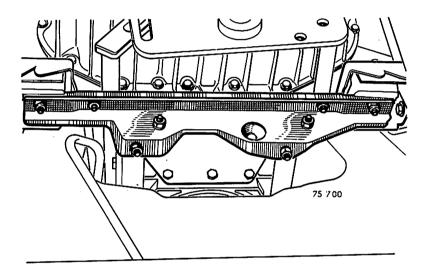


RENAULT 12 - 15 - 17 - 18

Place the DESYIL 701 ST jack fitted with four studs under the transmission (take the weight of the rear of the transmission).

Remove the rear crossmember.

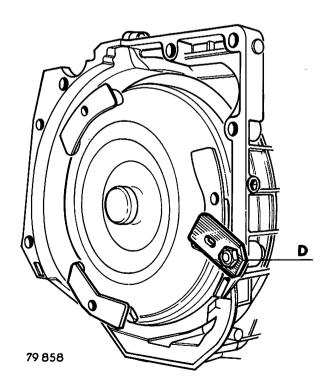
Lower the jack slightly and disconnect the speedometer and governor cables.



Remove the engine-transmission fixing bolts.

Remove transmission,

Fit retaining plate B.Vi.465 mark D in position to prevent the converter from separating as soon as it is removed.



Removing



RENAULT 12 - 15 - 17 - 18

Note the following when refitting:

REMOVING

Converter (1st or 2nd assembly)

The converter driving plate has one arm machined with sharp angles, this is marked with a dab of paint.

The converter has three fixing bosses, one of of which is opposite the timing hole for setting the distributor timing.

When assembling, fit the boss which is in line with the timing hole opposite the sharp angled machined arm on the driving plate (marked by a dab of paint).

Fit new Onduflex washers.

Tighten up the converter fixing bolts gradually and in relation so that it locates perfectly.

Then torque tighten them.

Drive shafts

Lightly lubricate the sunwheel splines with Molykote BR 2 grease.

Align the drive shafts in relation to the sunwheels.

ADJUSTING THE T.D.C. SENSOR (if vehicle is fitted with one)

The sensor should be about 1 mm (.040") away from the converter.

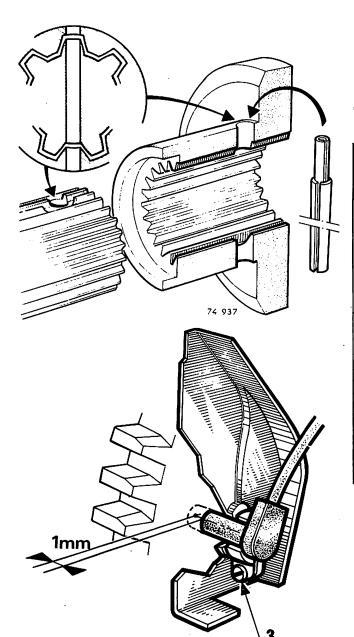
New T.D.C. sensor

The sensor has 3 lugs which will set its distance automatically.

Just push the sensor in until the 3 lugs touch the converter then tighten screw (3).

Re-using an old T.D.C. sensor

If the lugs are worn, push the sensor in until it touches the converter.



77 694-1

Mark its position by scribing a fine line on the T.D.C. body then withdraw it about 1 mm (.040").

Screw up screw (3).

Adjust:

- the selector control,
- the governor cable.

Check the computer and governor plugs and sockets and make sure that the earth wire is connected.

Fill the transmission with ELF RENAULTMATIC D2 or MOBIL ATF 220.

Removing - Refitting



Code 2227

RENAULT 16

SPECIAL TOOLS

Methods Reference	Description	Essential	Useful	Specifically for vehicle
B. Vi. 31-01	Set of 5 mm dia. rollpin drifts			
T. Av. 476	Ball joint extractor			
B. Vi. 465-D	Converter retaining plate			·
Mot.50	Torque wrench		:	
B. Vi. 455	Lifting hook assembly			
Mot 597	Lifting hook assembly			

TIGHTENING TORQUES

Roadwheels nuts 6 to 8 m. da N (45 to 60 lb/ft)

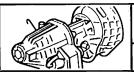
Suspension top ball joint nut 3,5 m. da N (26 lb/ft)

Steering arm ball joint nut 3,5 m. da N (26 lb/ft)

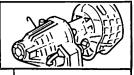
Converter fixing bolts 3 to 3,5 m. da N (22½ to 26 lb/ft)

The automatic transmission may be removed:

- either together with the engine from above using lifting hook assembly Mot.597.
- or on its own from above using lifting hook assembly B.Vi.455.



Refitting



RENAULT 16

REMOVING

Disconnect battery.

Drain the automatic transmission oil and remove the converter grille.

Disconnect the converter by unscrewing the 3 bolts using a universal jointed wrench inserted between the crossmember and engine.

Hold the bonnet open vertically.

Disconnect the starter.

Remove:

- the expansion bottle
- the spare wheel crossmember
- and camshaft pulley.

Disconnect:

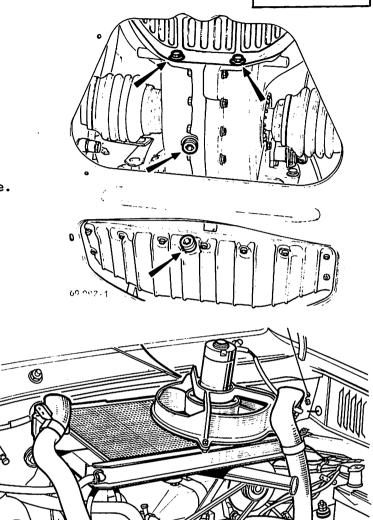
- both thermal switch wires on the radiator
- and the coolant hose supporting brackets.

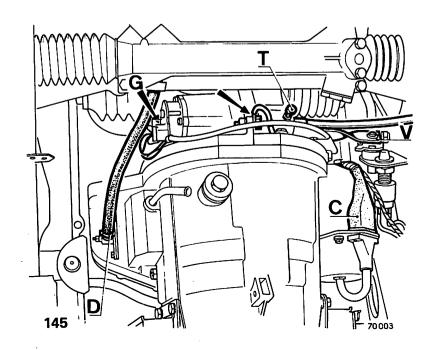
Lift and lay the radiator on the engine.

Disconnect:

- the speedometer cable (T).
- selector control arm (V).
- and governor cable (G).
- plugs:
 - for computer (C).
 - and for the sealed plug.
- the earth wire on the casing.
- and the vacuum capsule hose (D).

Release the harness from its clips.





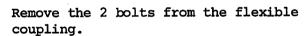


Removing

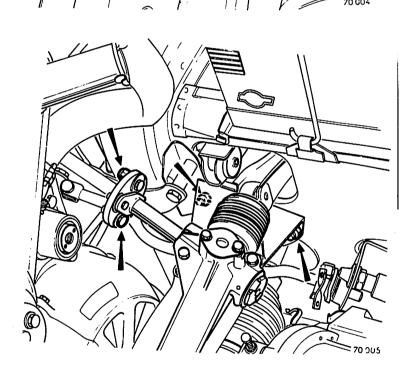


RENAULT 16

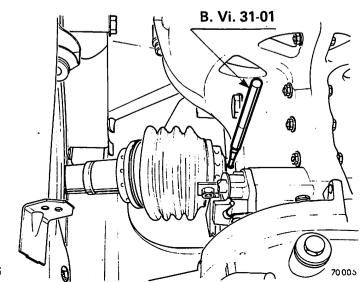
Turn the steering wheel on left lock and disconnect the R.H. steering arm from the rack end fitting and do the same for the L.H. steering arm.

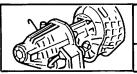


Remove the 4 bolts from the steering crossmember and take out the "steering box crossmember" assembly.



Punch out the drive shaft rollpins using drift B.Vi.31-O1.





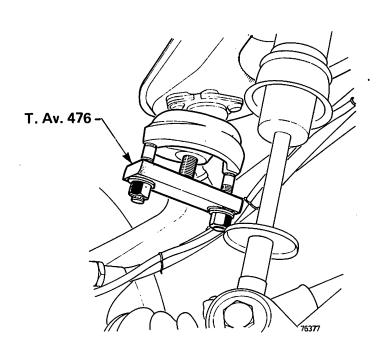
Removing



RENAULT 16

Remove the brake callipers without disconnecting the hoses, unscrew the R.H. and L.H. top ball joint nuts and fit extractor T.Av.476 to remove the ball joints.

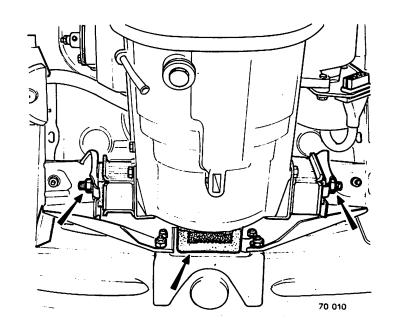
Withdraw the drive shafts from their sunwheels.



Remove the nuts from the side mounting pads.

Remove the radiator centre mounting.

Unscrew the bolts between the engine and transmission.



Removing



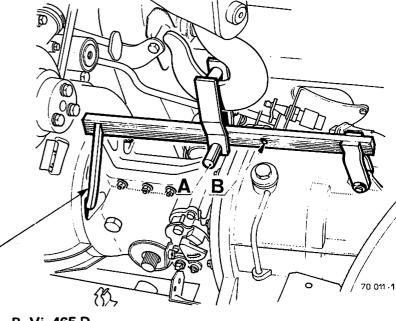
RENAULT 16

Attach lifting hook assembly B.Vi.455 to the transmission and pin the bar through hole (A).

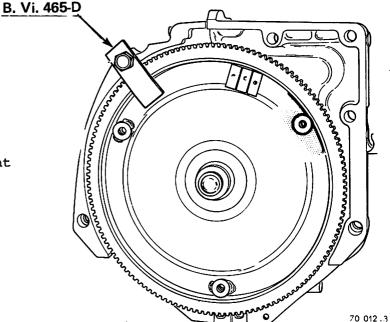
Raise the transmission slightly with the block and tackle and ease it away from the front mounting.

Lower the block and tackle and let the transmission rest on the front crossmember.

B. Vi. 455



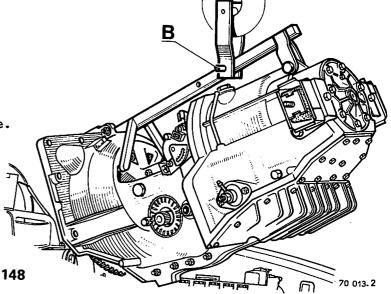
Fit plate B.Vi.465, mark D, to the converter as soon as it is clear to prevent it becoming disconnected.

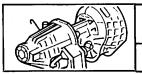


Remove the lifting hook assembly from the block and tackle.

Now pin the bar through hole (B).

Raise the transmission to clear the vehicle.





Refitting



RENAULT 16

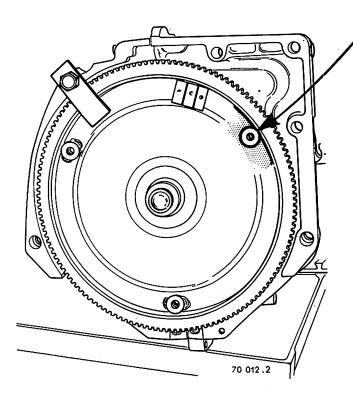
REFITTING

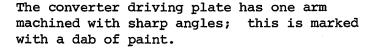
Check that the locating dowels are in position on the engine.

Fit lifting hook assembly B.Vi.455 to the transmission and pin the bar through hole (B).

Lower the transmission so that it rests on the crossmember then repin the bar through hole (A).

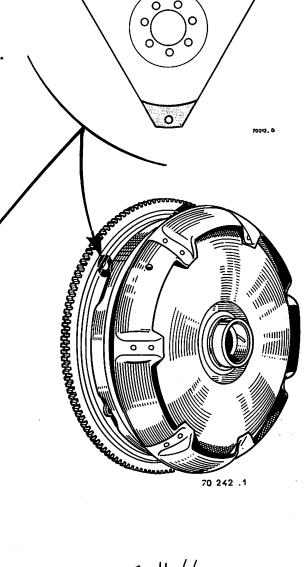
Remove the converter retaining plate; offer up transmission and fix it in position.





The converter has 3 fixing bosses, one of which is in line with the distributor timing hole.

When assembling, fit the boss which is in line with the timing hole opposite the sharp angled machined arm on the driving plate (marked with a dab of paint).



Fit new Onduflex washers. Tighten up the converter fixing bolts gradually and alternately so that it is located perfectly.

70 015.A

Then torque tighten the bolts.



Refitting



RENAULT 16



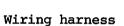
Drive shafts

Lubricate the sunwheel splines sparingly with Molykote BR.2 grease.

Line up the rollpin holes in the drive shafts with those in the sunwheels.

ADJUSTMENTS

Adjust the selector control, kick-down switch and governor cable.



Check the computer and governor plugs and sockets and make sure that the earth wire is connected.

ADJUSTING THE T.D.C. SENSOR

The T.D.C. sensor should be about 1 mm (.040") from the converter to function correctly.

New T.D.C. sensor

The sensor has 3 lugs which set its position automatically.

Push the sensor in until the 3 lugs touch the converter and screw up screw (3).

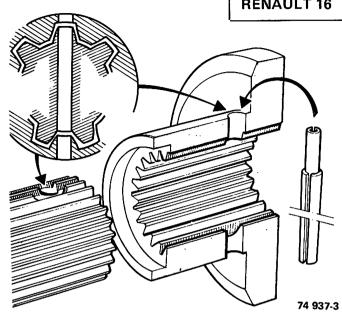
Re-using an old sensor

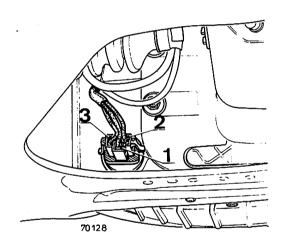
Push the sensor in until it touches the converter if the lugs are worn.

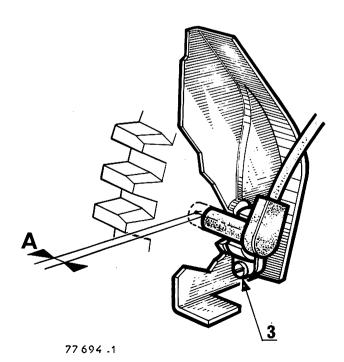
Mark its position on the sensor body by scribing a fine line then withdraw it about 1 mm (.040").

Screw up screw (3).

Fill the transmission with ELF RENAULTMATIC D2 or MOBIL ATF 220 oil.









Code 2233 Dismantling - Re-assembling - Adjusting



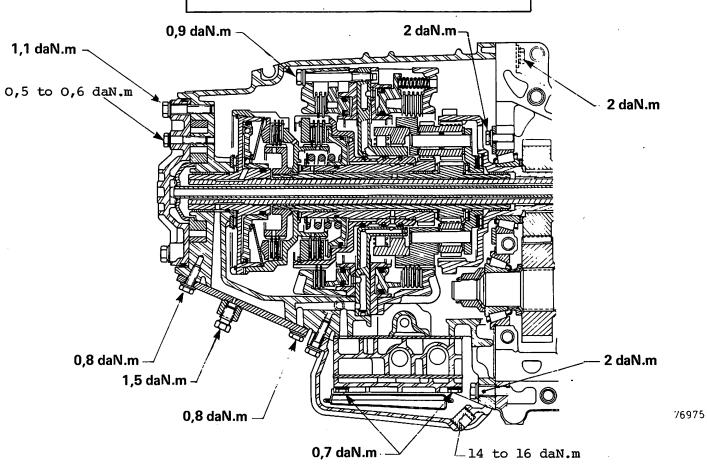
Type 4139 Automatic transmission

SPECIAL TOOLS

Methods Reference	Description	Essential	Useful	Specifically for vehicle
BVi. 489-14	Set of tools for overhauling clutches and brakes			
BVi. 489-19	Tooling for overhauling automatic transmission			
BVi. 465	Tooling for changing converter oil seal		ū	
BVi. 564	Brake centring mandrel			

TIGHTENING TORQUES

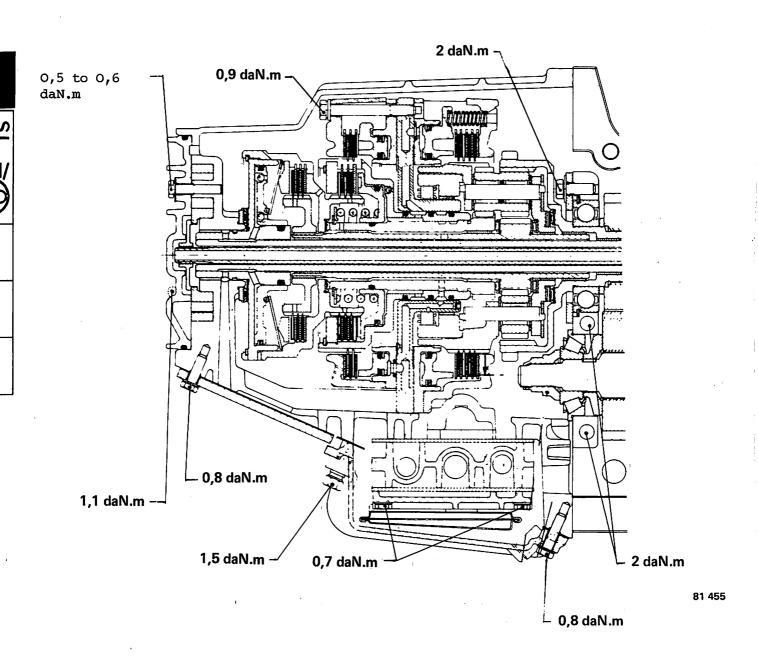
4139 ALL TYPES EXCEPT 40-41-50



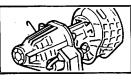
F1 - freewheel carrier assembly bolts 2 m. da N (15 lb/ft) F1 and F2 fixing bolts in mechanism 2 m. da N (15 lb/ft) casing.



4139-40-41-50



F1 \leftarrow freewheel carrier assembly bolts 2 m. da N (15 lb/ft) F1 and F2 fixing bolts in mechanism 2 m. da N (15 lb/ft) casing.



Dismantling



4139

A bench covered with protective material (rubber or thick plastic sheet) must be used when dismantling and handling components.

Before dismantling the casing, remove:

- the converter
- mounting pad
- and dipstick.

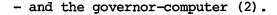
4139 - all types except 40-41-50

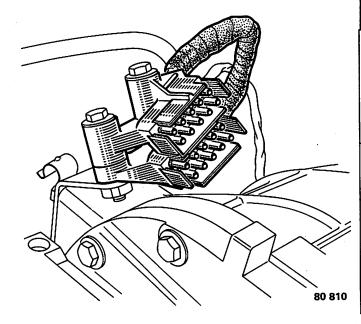
- the governor
- computer
- and wiring harness.

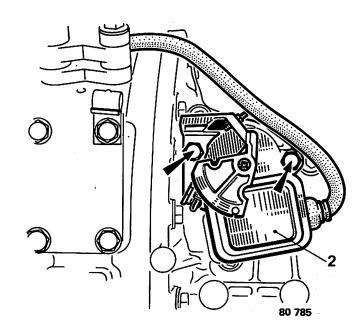
4139-40-41-50

 the 2 bolts holding the harnesses for the governor-computer and multi-function switch-sealed plug and socket.







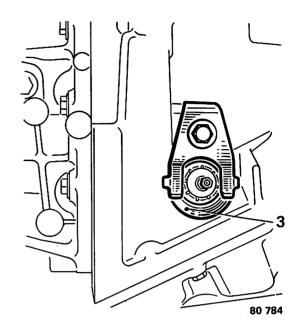






4139

- the vacuum capsule (3).



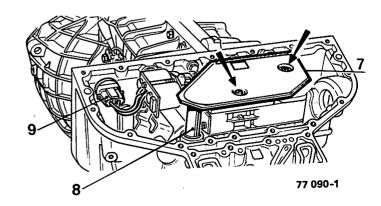
72 791-2

- sump (4).

socket (9).

- bottom cover (5) and gasket.

- oil pump gauze (7) and gasket.
Remove the oil pump suction pipe seal (8).
Disconnect the plug from the sealed



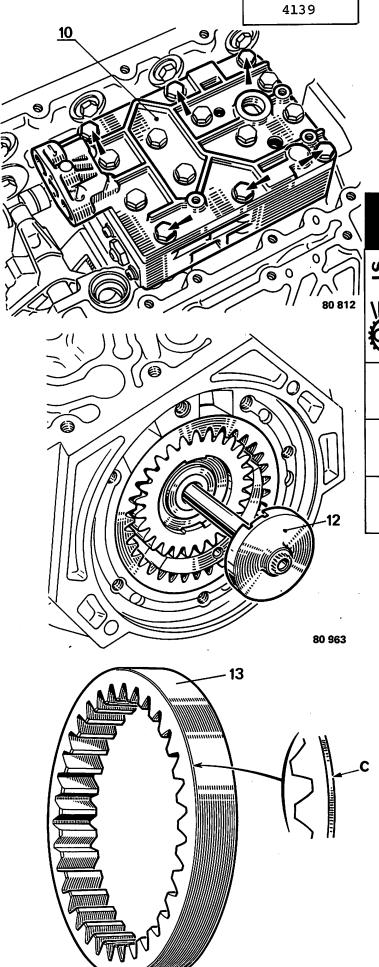
80 962

Remove hydraulic distributor (10). (Only unscrew the 6 bolts marked with arrows).

Remove:

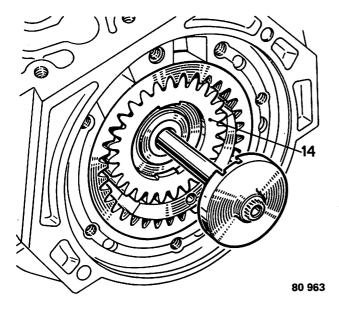
- the oil pump cover
- and oil pump shaft (12).

- involute tooth ring (13). (Mark its direction of fitting if it is to be re-used C = chamfer).

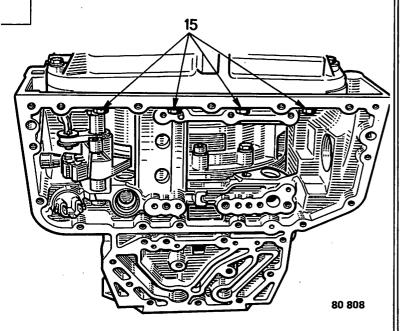




- gear (14)



Remove the 4 inner assembly bolts fixing the differential housing to the mechanism casing (15).

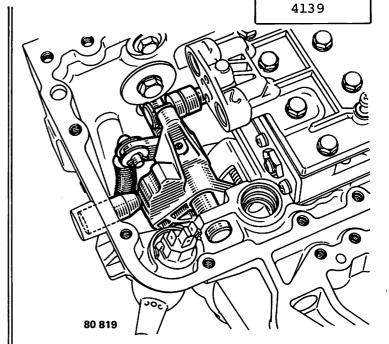


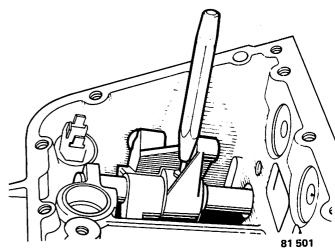
Quadrant and input shaft

Remove the rollpin.

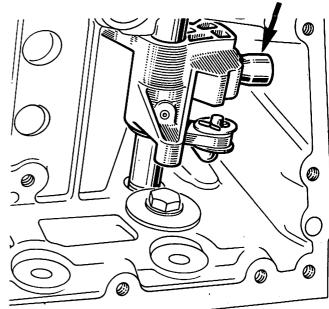
Remove the relay shaft.

Take out the various components.





The bush with the detent should not be disturbed unless it is intended to change it.





Dismantling

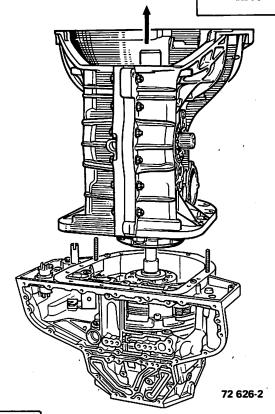


4139

Place the transmission on end with the casing resting on the oil pump housing.

Remove the housing assembly bolts.

Separate the differential and mechanism casings.

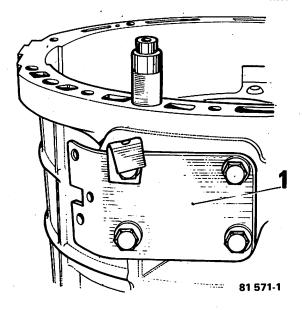


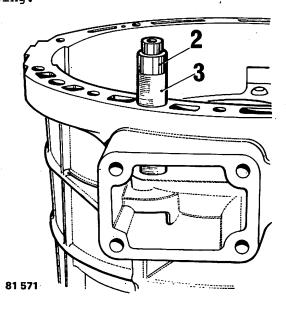
4139-40-41-50

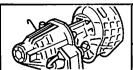
Dismantling the parking latch

Remove:

- plate (1) and its gasket
- cam follower (2)
- shaft (3)
- the parking latch
- and the return spring.







Dismantling



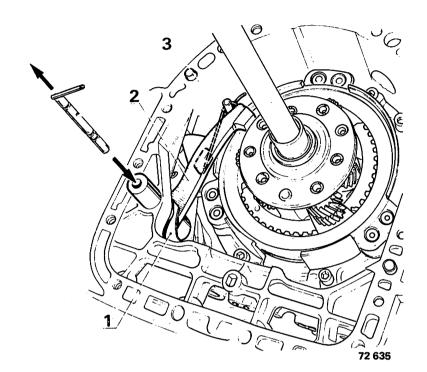
4139 EXCEPT 40-41-50

Dismantling:

Remove the parking latch shaft.

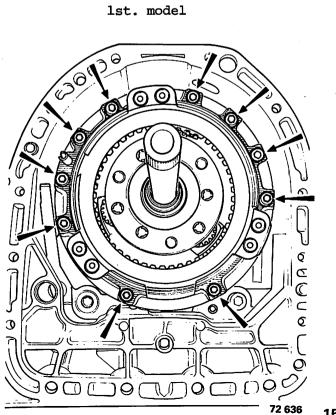
Take out:

- cam follower (1)
- parking latch (2)
- and return spring (3).

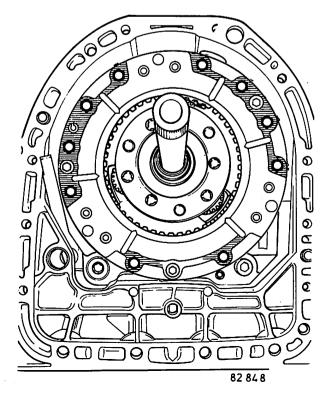


4139 - ALL TYPES

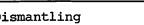
Remove the centre bearing fixing bolts.



2nd. model



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Withdraw the drive train assembly by gripping the turbine shaft.

Lay the complete drive train on end, resting on a support (a piece of tube).

Withdraw the needle roller thrust pad from inside the casing.

Separate the various parts of the drive train:

- Epicyclic gear train (1)
- Pl sunwheel (2)
- F1 F2 assembly (4)
- E2 clutch (5)
- El clutch (6) and turbine shaft.

Take out the needle roller thrust pads between P2 and E1 (7) and P1 and E2 (3).

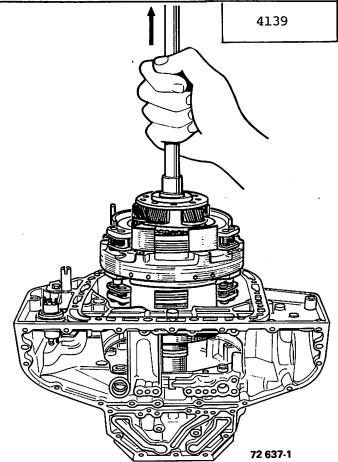
Note:

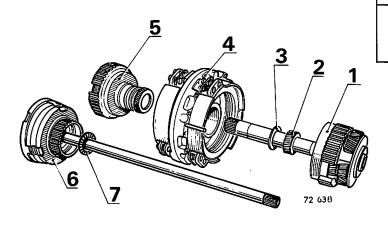
The thrust pad and shim inside the epicyclic gear train cannot be dismantled.

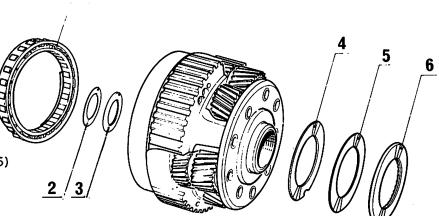
Epicyclic gear train Remove freewheel (1)

Take out:

- the adjusting shim (4)
- needle roller thrust pad plate (5)
- needle roller thrust pad (6)
- shim (2)
- and needle roller thrust pad (3) (needles facing Pl).



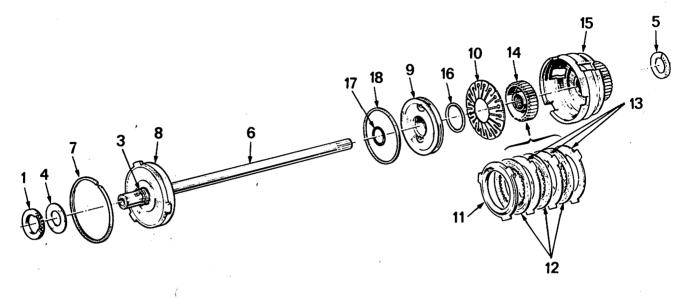






4139

E1 Clutch



77 054-1A

Remove needle thrust pad (1).

Remove seal ring (3) before removing needle roller thrust pad (4).

Remove needle roller thrust pad (5).

Turbine shaft (6) and bearing (8) are integral.

Push down the El bearing and take out retaining ring (7).

Separate the various parts:

- bearing (8)
- piston (9)
- diaphragm (10)
- thrust plate (11)
- lined discs (12)
- intermediate plain discs (13)
- hub (14)
- and bellhousing coupling (15)

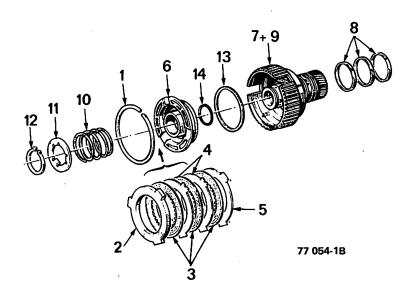
Push the piston out of its bore by blowing compressed air through the feed hole.





T.A. 4139

E2 Clutch



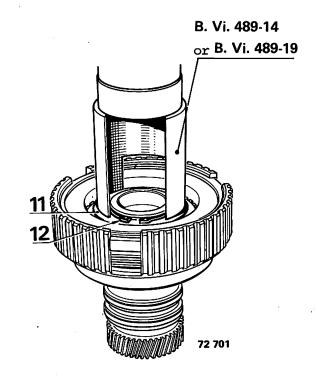
Using tool B.Vi.489-14 or B.Vi.489-19 mark O7 and a press, slightly compress the clutch return spring.

Remove:

- circlip (12),
- bearing cup (11),
- spring (10),
- and 3 sealing rings (8).

Remove:

- thrust plate snap ring (1),
- plate (2),
- 3 lined discs (3),
- 2 wave form discs (4),
- the plain disc (5),
- piston (6),
- and sunwheel (9).





Dismantling



4139 - ALL TYPES EXCEPT 40-41-50

4139

DISMANTLING F1 and F2 BRAKES

1st assembly (cast iron bellhousing)

Remove the Fl and F2 snap rings.

For the Fl, remove:

- thrust plate (10)
- lined discs (8)
- plain discs (9)
- thrust plate
- and 6 springs (12) and 12 cups (11) for piston return.

For the F2, remove:

- thrust plate (13)
- lined discs (15)
- wave form disc (14)
- thrust plate (16)
- 6 springs (18)
- 6 short cups (17)
- and 6 long cups (19).

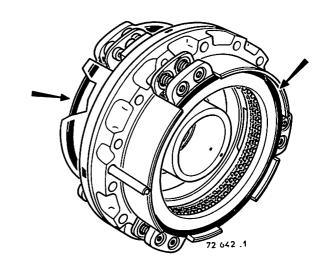
Remove the 3 assembly bolts for the brake bellhousings.

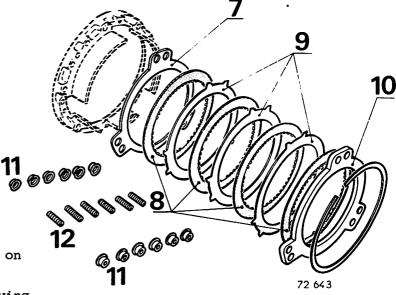
Separate:

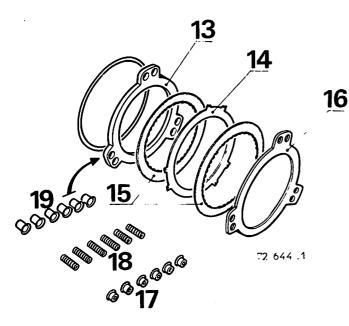
- the F2 bellhousing (2)
- freewheel bearing (3)
- Fl intermediate plate (4)
- and Fl bellhousing (6).

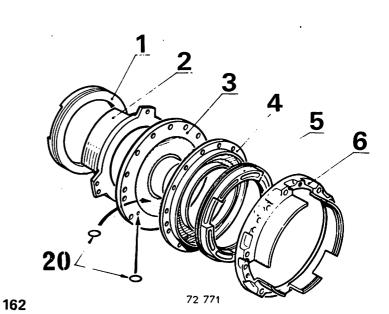
Remove the 2 "O" rings (20) between the freewheel bearing and F2 bellhousing on the one hand and the intermediate plate on the other hand.

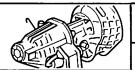
Push out both pistons (1 and 5) by applying compressed air to the brake feed holes.











Dismantling



4139

2nd assembly (aluminium bellhousing)

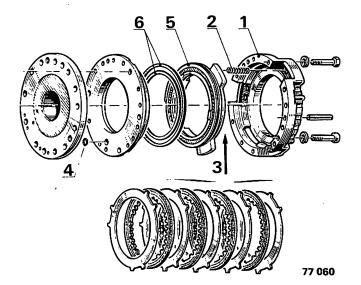
Fl Brake

Unscrew the 3 bellhousing bolts.

Remove:

- bellhousing (1),
- 6 springs (2),
- and the steel disc and lined disc group
 (3)

Retain "O" ring (4) between the freewheel bearing and Fl piston bore.



F2 Brake

Unscrew the 3 bellhousing bolts.

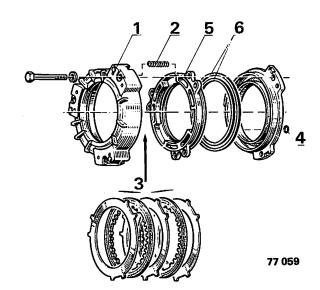
Remove:

- bellhousing (1),
- 6 springs (2),
- and the steel disc and lined disc group
 (3)

Retain "O" ring (4) between the freewheel bearing and F2 piston bore.

Push out both pistons (5) with compressed air applied to the brake feed holes.

Remove piston seals (6).





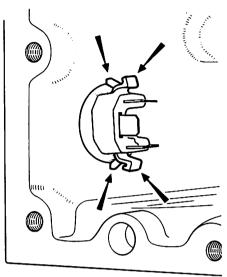


4139 ALL TYPES EXCEPT 40-41-50

REMOVING THE SEALED WIRING HARNESS

On the mechanism casing:

- remove the sealed junction box plug,
- pinch the two securing clips and two locking tabs together, then push to free the plug.



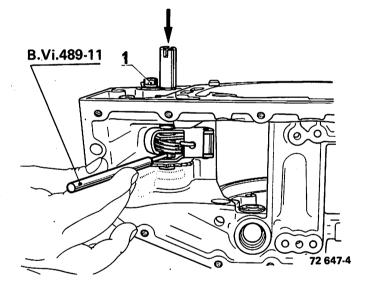
72 645

DISMANTLING THE ENGAGEMENT SHAFT

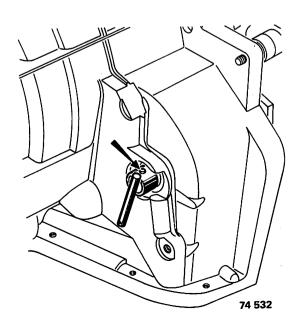
Remove the bolt and shaft lockwasher (1).

Push the shaft in about 1/8" to 3/16" (arrow) to be able to free the "O" ring.

Punch out the engagement shaft rollpins using drift B.Vi.489-11.



Remove the operating lever.



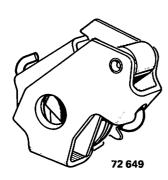
Dismantling



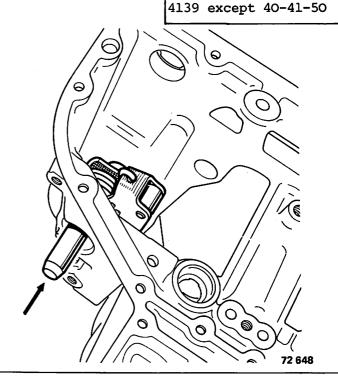
Remove the "O" ring.

Slip socket B.Vi.498-08 over the end of the shaft.

Tap the socket to knock out the shaft.



Retain the engagement shaft, operating arm and toothed quadrant.



CLEANING

4139 - ALL TYPES

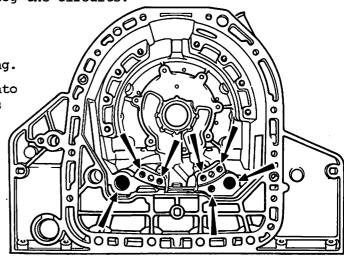
Do not use trichlorethylene which might lead to harmful deposits on the oil seals.

Cleaning rags must not be used as these could leave fluff behind and clog the circuits.

Use: .

- white spirit or a degreaser (except on oil seals) and compacted cotton wool for cleaning.
- compressed air, directing it particularly into all holes, oil feed and lubrication channels in the following:
- mechanism casing,
- freewheel bearing plate,
- reverse sunwheel,
- E2 clutch bellhousing (ball valves),
- El clutch piston (ball valves),
- El clutch hub,
- pump cover,
- pump shaft,
- turbine shaft,
- stator support,
- converter oil return calibrating jet,
- and planet wheel carrier.

Oil the parts with the recommended oil immediately after cleaning.



Converter

Fill the converter with recommended oil only.

The method to be used for cleaning is to allow the converter to drain off for a long period then pump it out using a syringe to suck out the oil in the centre of the turbine hub.

Checking



4139

CONVERTER AND DIFFERENTIAL HOUSING

Make sure that the following are serviceable:

- all gasket faces,
- stator support housing,
- and housing breather, if fitted.

MECHANISM CASING

Check condition of:

- the oil pump gears and their housing,
- drive,
- and cover.

The "mechanism casing - gear - involute gear" assembly is matched.

If one part has to be replaced then the whole assembly must be changed.

Also check the condition of the white metal-faced sleeve on the El clutch the ring groove, the joint faces on the sealed junction box and the engagement shaft and gasket faces.

CLUTCHES AND BRAKES

General instructions

Check the condition of the intermediate discs. Any discs showing traces of overheating (blueing, yellowing, etc.) or with damaged surfaces, must be changed.

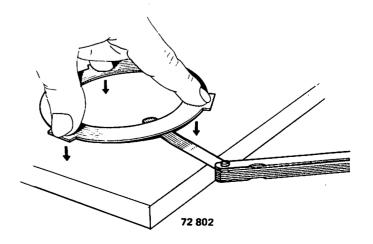
Check that the discs slide freely on the hub splines and that the plates slide freely in the bellhousings.

Wave-form discs (E2 and F2)

Check that the wave form is correct using a set of feeler gauges.

Hold a disc on a surface plate without pressing hard and slide the feeler between the surface plate and the disc at three points.

The wave forms should measure from 0,25 to 0,45 mm (.010 to .018").



Checking



4139

Lined discs

Change any worn discs or those showing signs of overheating (blackened lining) or breaking away.

Bearing plates and thrust plates

Change those plates showing signs of overheating, bad surface condition, run-out or taper.

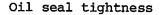
As a general rule, if one of the assemblies (E1, E2 clutches; F1, F2 brakes) has overheated abnormally, then all intermediate discs and linings in the worn assembly must be changed.

Oil seals (rectangular cross section or 'O' ring type).

Make sure that the oil seals fit snugly in their grooves.

Using a vernier, measure across the seal at two points at right angles to each other; do not press in.

Take an average of both readings and compare it with the seal groove reading.

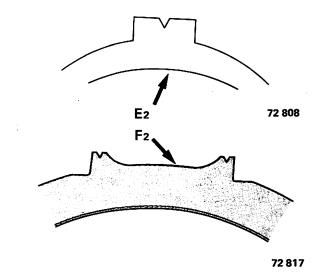


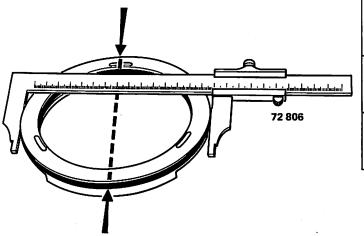
0,2 to 0,7 mm (.008 to .028") over the diameter.

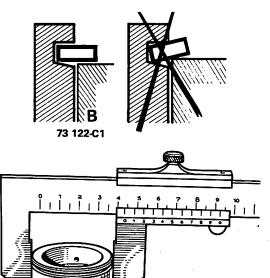
Change all oil seals whose tightness is outside tolerance or which are damaged.

Check the snap ring grooves in the thrust plates. (Fl and F2 grooves have parallel sides).

Systematically change all oil seals in the event of having any doubt as to the oil used in the transmission or if they have been in contact with trichlorethylene.







72 807-1

Checks



4139

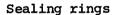
Depressurizing ball (El and E2)

The El clutch piston (2 balls) and E2 clutch bellhousing are fitted with depressurizing balls located by retaining tabs.

Each ball must move very freely in its location and must neither stick to its seat nor to the retaining tab end.

Check the amount of ball travel (C) which should be approximately 1 mm (.040").

Change the complete El piston or complete E2 bellhousing in the event of faulty operation.



The El clutch bearing and the E2 clutch bellhousing have sealing rings.

Check:

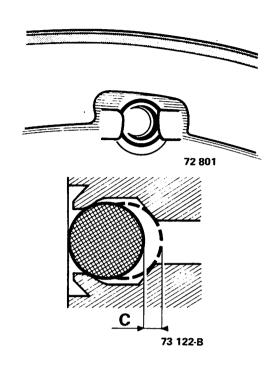
- the amount of wear of seal lands (1)
- the condition of the bottom of ring grooves (2) they should be sharpangled, allowing the ring to fully bottom in its groove(3)
- ring gaps (4). They should fit together perfectly (5).

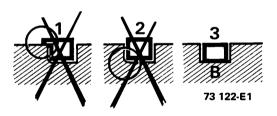
The clearance at joint J should measure between 0,05 and 0,35 (.002 and .014").

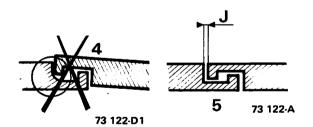
EL Clutch

In addition to the discs, balls, ring and oil seals, check:

- the surface condition of the piston bore
- diaphragm (for breakage)
- hub (disc marks on splines)
- fitting of both sleeves in the bearing
- fitting of the snap ring on the turbine shaft, if applicable.

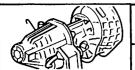






E2 Clutch

- the piston bore
- return spring, cup and snap ring
- and the fitting of the P2 sunwheel in the bellhousing.



Checks



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EPICYCLIC GEAR TRAIN

Check:

- the condition of the planet wheel teeth (the planet wheels should also spin freely on their shaft),
- condition of white metal-faced sleeves,
- freewheel locating bore,
- freewheel,
- and needle roller thrust bearing and bearing plate.

The freewheel may be changed.

The whole assembly must be changed if any other parts are worn.

Freewheel bearing plate

Check:

- that plugs (1-2-3-4-5) are securely in position,
- bore (6) for the 3 rings,
- track (7) for the freewheel,
- and oil feed and lubrication holes.

WHITE-METAL FACED SLEEVES

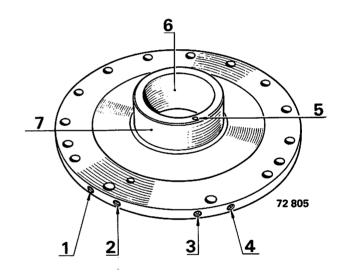
Change all parts which have worn white metal faced sleeves:

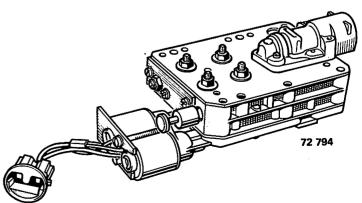
- in the mechanism casing,
- in the forward speed Pl sunwheel,
- in the E2 clutch and P2 sunwheel assembly,
- in the epicyclic gear train,
- on the output shaft,
- on the stator shaft.

HYDRAULIC DISTRIBUTOR

The distributor and pressure regulator assembly must not be dismantled. Only the solenoid valves may be changed.

The hydraulic distributor and its pressure regulator must be changed in every instance where an automatic transmission is dismantled on account of worn clutches or brakes or poor gear change quality.







Re-assembling

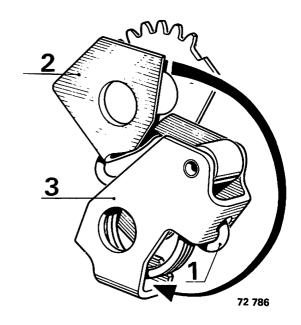


Fit the 3 oilway blanking plugs after drying the housing well and blowing it out with compressed air.

4139 - ALL TYPES EXCEPT 40-41-50

Fitting the toothed quadrant and engagement shaft.

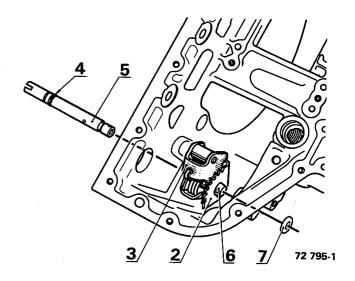
Assemble toothed quadrant (2) with roller cage lever (3) (new spring (1)).



Lubricate 'O' rings (4) and (7) on engagement shaft (5).

Fit oil seal (4) on the shaft and fit sleeve B.Vi.489-18 into the "lever-quadrant-roller cage" assembly (2 and 3).

Place this assembly into the housing and slide engagement shaft (5) along its bore into sleeve B.Vi.489-18.





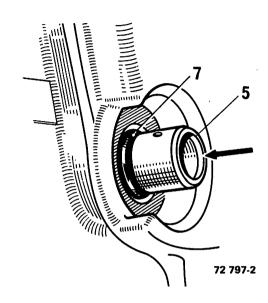
Re-assembling

4139 EXCEPT 40-41-50

Push engagement shaft (5) along the minimum amount necessary to reveal the groove for 'O' ring at the other end.

Fit 'O' ring (7) in its groove.

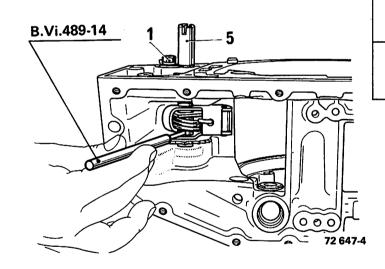
Push shaft (5) back slightly.



Using drift B.Vi.489-14 mark 11, punch in the rollpins which secure the toothed quadrant and locking latch.

Rollpins protrusion: 1 to 2 mm (3/64 to 5/64") on the toothed quadrant side.

Fit lock bolt (1) with its flat washer.



4139 - ALL TYPES

CONTROL ELEMENTS E1, E2, F1, F2.

When assembling, make sure that:

- the piston seals are tight
- the condition of the discs and plates is satisfactory
- the E2 clutch and F2 brake have correct operating clearances.

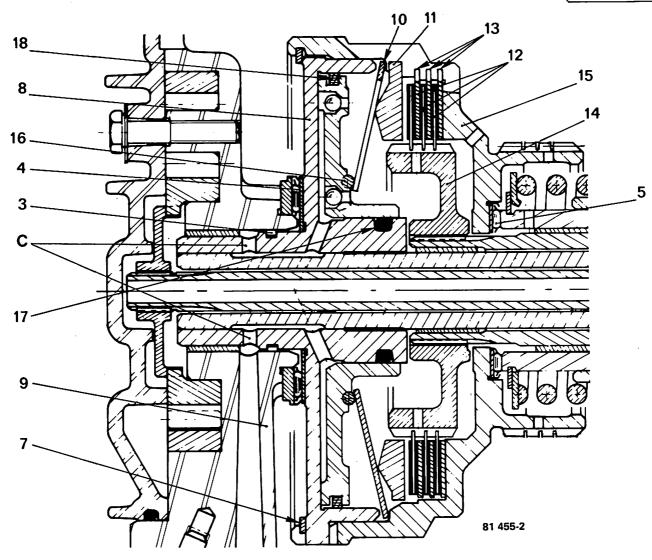
Dip the lined discs in recommended oil before assembly.

Re-assembling



E1 CLUTCH





- 3 Seal ring
- 4 Needle roller bearing thrust plate
- 5 Needle roller thrust bearing
- 7 Snap ring
- 8 Bearing
- 9 Piston
- 10 Diaphragm
- 11 Thrust plate
- 12 Lined discs
- 13 Intermediate plain discs
- 14 Hub
- 15 Connecting bellhousing
- 16 Diaphragm thrust ring
- 17 "O" ring
- 18 Rectangular section seal
 - C El piston feedhole

Re-assembling

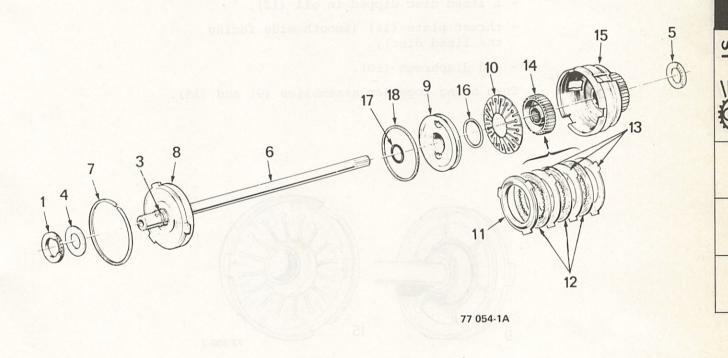


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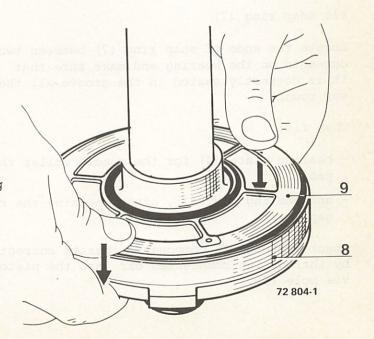
Fit thrust ring (16) onto piston (9). Lubricate the two piston seals and fit:

- rectangular section seal (18) on piston (9),
- and 'O' ring (17) onto El bearing hub.

Lightly lubricate the bore and that part of the hub in which the piston slides.



Fit piston (9) (2 balls) into its housing with flange upwards by applying finger pressure and tilting it to the right and left alternately, with piston and bellhousing castellations in line.



Re-assembling

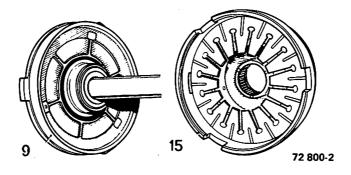


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In bellhousing (15), fit in the following order:

- hub (14) (recessed section towards top),
- 1 plain intermediate disc (13),
- 1 lined disc dipped in oil (12),
- 1 plain intermediate disc (13),
- 1 lined disc dipped in oil (12),
- 1 plain intermediate disc (13),
- 1 lined disc dipped in oil (12),
- thrust plate (11) (smooth side facing the lined disc),
- and diaphragm (10).

Then bring together assemblies (9) and (15).



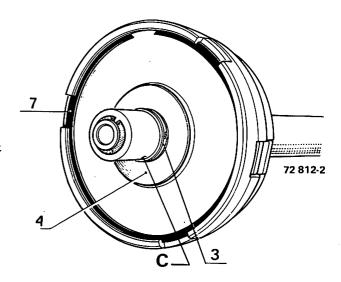
Fit snap ring (7)

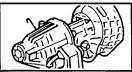
Locate the ends of snap ring (7) between two cut-outs on the bearing and make sure that it is correctly seated in the groove all the way round.

Then fit;

- bearing plate (4) for the needle roller thrust pad,
- and sealing ring (3), after checking the ring gap.

Check that the El components operate correctly by introducing compressed air into the piston via hole (C).

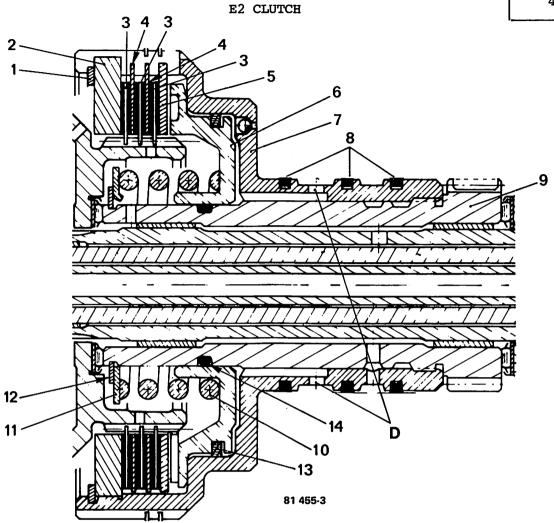




Re-assembling



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- 1 Snap ring
- 2 Thrust plate
- 3 Lined disc
- 4 Wave form disc
- 5 Thrust plate
- 6 Piston
- 7 Bellhousing
- 8 Sealing rings
- 9 P2 sunwheel
- 10 Spring
- 11 Cup
- 12 Snap ring
- 13 Piston rectangular seal
- 14 "O" ring
- D E2 piston feed hole

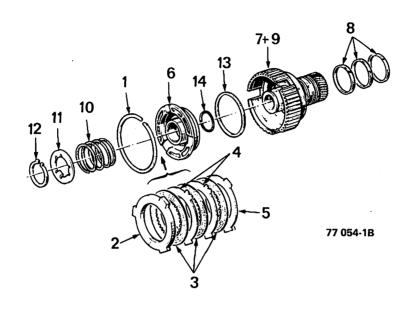
Note:

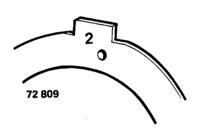
7 and 9 cannot be separated.

Re-assembly

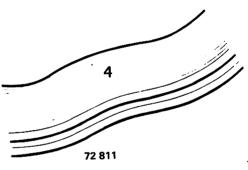


4139









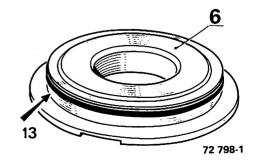
Fit the 3 sealing rings (8) to E2 bellhousing (7), after making sure of:

- the ring gaps, by trying them in the freewheel bearing
- the condition of the 3 grooves in bellhousing (7).

Lubricate the two piston seals and fit;

- rectangular section seal (13) on piston (6)
- and 'O' ring seal (14) on the piston hub in E2 bellhousing (7).

Check the tightness of the seals in their respective bores.





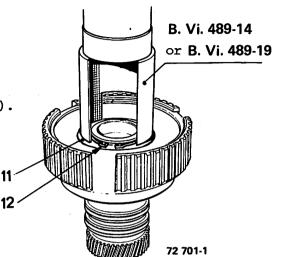
Re-assembling



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Assemble piston (6) in its bore in bellhousing (7).

Using a press and tool B.Vi.489-14 or B.Vi.489-19 mark O7 taking care to guide cup (11), compress spring (10) and fit snap ring (12).



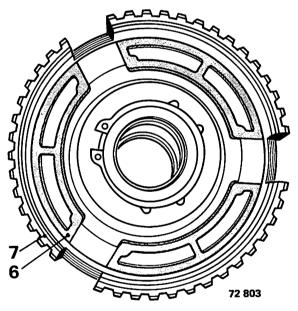
The slots in piston (6) and the bellhousing must be in line with each other.

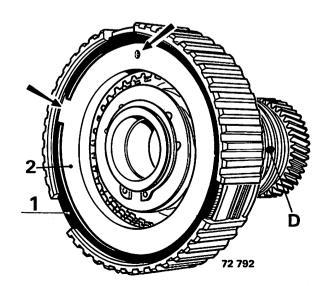
Then fit the following in the order shown to the piston, having first dipped them in oil:

- the thrust plate (5),
- 1 lined disc (3) dipped in oil,
- 1 wave form disc (4),
- 1 lined disc (3) dipped in oil,
- the second wave form disc (4).
- 1 lined disc (3) dipped in oil,
- and bearing plate (2) (punch marked face towards the outside).

Fit snap ring (1), arranging the ends as shown in the sketch (arrows).

Check the operation of the E2 components by supplying compressed air to the piston via hole (D).





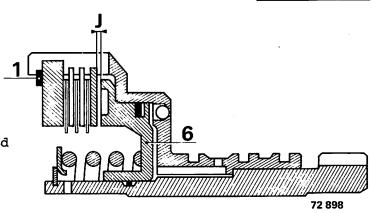


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Checking and adjusting the operating clearance

This operation consists of establishing the value of clearance J, that is the amount of disc end play, which is restricted at one end by:

- the bearing plate resting against snap ring (1)
- and, at the other end, by piston (6) at the end of its travel.



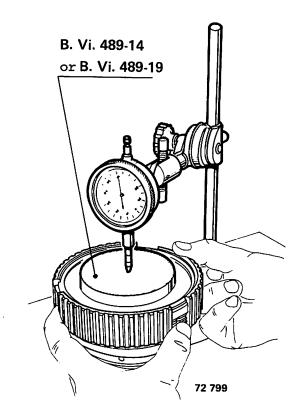
Arrange clutch E2 and a clock gauge bracket on a surface plate.

Lay tool B, Vi, 489-14 or B, Vi, 489-19 mark O6 on top of the disc pack.

Set the clock gauge to zero, lift up the disc pack (with a snap ring pushed up against its top groove but without compressing the disc undulations) and read off clearance J on the clock.

Clearance J should be between 1,1 and 2,1 mm (.044" and .083").

If clearance J is greater than 2,1 mm (.083"), fit a plate 2,5 mm (.099") thick.



F1 - F2 BRAKES

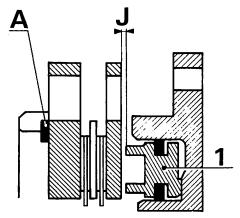
1st. assembly (cast iron bellhousing)

Checking and adjusting the F2 operating clearance.

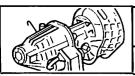
This operation consists of finding out the value of clearance J, that is of the disc stack in its location.

Movement is limited by:

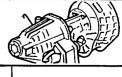
- snap ring (A) at one end,
- and piston (1) at the end of its travel at the other end.



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Re-assembling



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Fit into the F2 bellhousing:

- piston (1) without its seal
- the thrust plate
- 1 lined disc
- 1 intermediate wave form disc 2
 mm (.079") thick
- 1 lined disc
- the thrust plate
- and the snap ring.

Set the clock gauge to zero with the needle resting on the bearing plate.

Lift the bearing plate up so that it touches the snap ring, the latter being hard up against the top of the groove.

Read off the value of clearance J.

Take readings at several points round the plate and calculate the average.

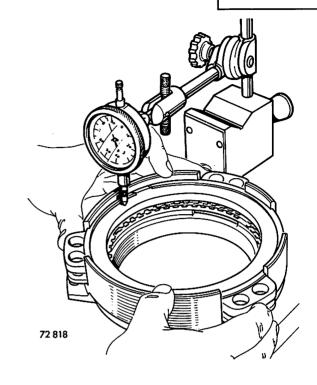
Clearance J should be between 0,75 and 1,4 mm (.030 and .055").

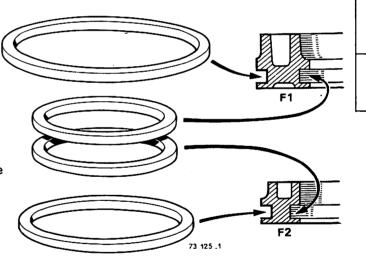
Fit a wave form disc 1,5 (.059") thick if the clearance is less than 0,75 mm (.030").

Recheck the assembly if it is more than 1,4 mm.

Lubricate the 4 Fl and F2 piston seals and fit them to their respective grooves.

Check the tightness of the seals in the brake bellhousing bores beforehand.

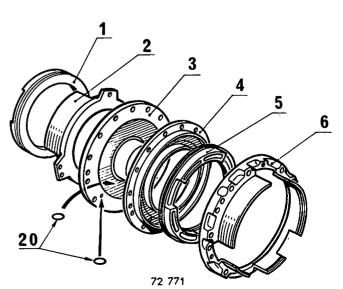




Line up the piston flanges with those in the brake bellhousings.

Fit Fl piston (5) in intermediate plate (4) and F2 piston (1) in the matching bellhousing, taking care not to jam the seals.

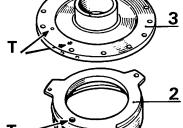
Insert the 2 "O" ring seals (20) in the spotfaces on the intermediate plate and on the F2bellhousing.





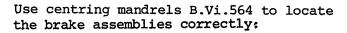
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Feed holes (T) should all be in line when assembling.



- the calibrated holes used earlier to locate with dowels B.Vi.489-14, mark 05 have been discontinued.

Fit mandrel (A) from B.Vi.564 over freewheel bearing (3).

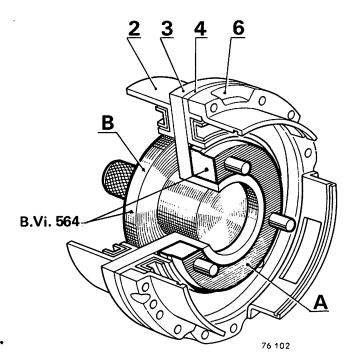
Stack:

- intermediate plate (4) and its piston - and the Fl bellhousing (6).

Turn the assembly over and let it rest on

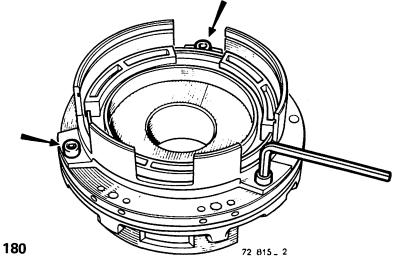
Fl bellhousing (6). Fit mandrel (B) from B.Vi.564 inside the freewheel bearing and Fl assembly.

Centralize the F2 bellhousing and its piston.



Line up the piston flanges with those in the brake bellhousings.

Remove the locating mandrels.







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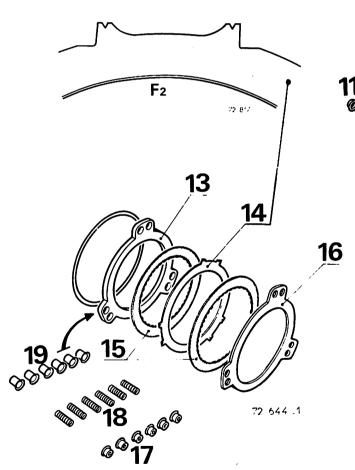
Fit the previously checked assembly on the F2 brake side (2):

- thrust plate (16)
- the 1st. lined disc dipped in oil (15)
- the wave form disc (14)
- and the 2nd. lined disc dipped in oil (15).

Then fit:

- 6 short cups (17) to thrust plate (16)
- 6 springs (18)
- 6 long cups (19) over the springs (thrust plate side).

Then fit thrust plate (13) and the snap ring.



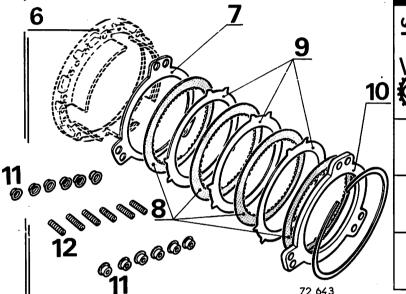
Fit the following in the order shown to the Fl bellhousing (6):

- thrust plate (7)
- 1 lined disc dipped in oil (8)
- l intermediate disc (9)
- 1 lined disc dipped in oil (8)
- 1 intermediate disc (9)
- and 1 lined disc dipped in oil.

Fit cups (11) and springs (12) to the thrust plate.

Fit:

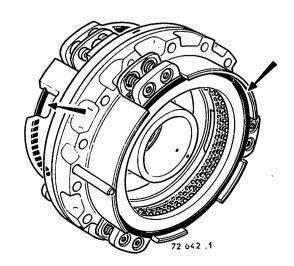
- thrust plate (10)
- and the snap ring.



Check that:

- both snap rings are seated correctly in their grooves.
- the snap ring gaps must lie between any 2 cut-outs in the bellhousing for the plate lugs.

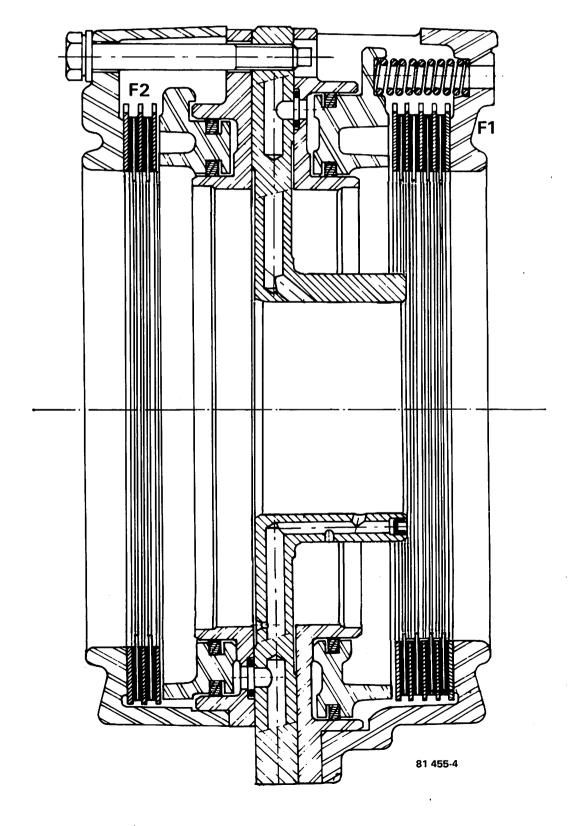
Fit the parking latch stop rollpin, if applicable.



Fl and F2 BRAKES

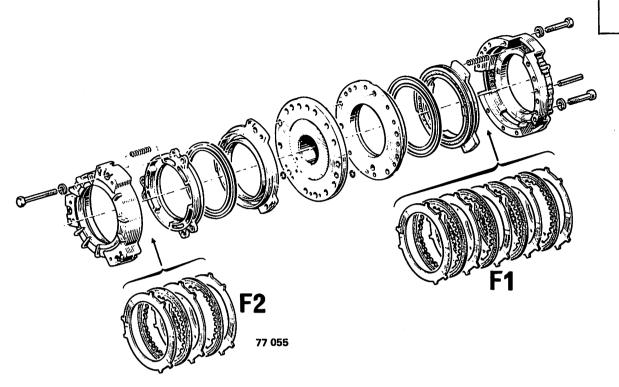
4139

2nd. assembly (aluminium bellhousing).





Re-assembling



Checking and adjusting the F2 brake operating clearance

This operation consists of establishing the value of clearance (J) for the disc pack in its location.

Movement is restricted by:

- by piston (P) at the end of its travel at one end,
- and by bellhousing (C) at the other end.

Insert piston (P) without its seal, in the F2 piston bore.

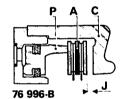
Stack:

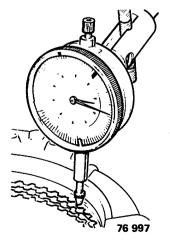
- 1 plain disc 1,5 mm thick,
- 1 lined disc,
- the wave form disc (A) 2 mm thick marked with 2 notches,
- 1 lined disc,
- and 1 plain disc 1,5 mm thick.

Fit the bellhousing and secure the assembly to the freewheel bearing.

Set the gauge to zero with the clock gauge needle resting on a spline on the first lined disc.

Lift up the steel disc and lined disc stack so that it contacts the bellhousing (hard up against the top).





Take readings at several points and calculate an average.

Clearance (J) should be between 0,70 and 1,70 mm (.027 and .067").



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If it is different, check all parts which might affect value (J) (piston - steel and lined discs - bellhousing).

RE-ASSEMBLING

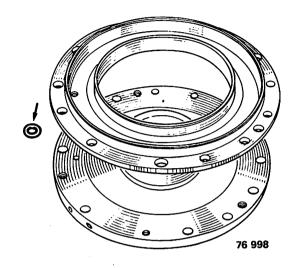
Lubricate the four seals for the Fl and F2 pistons and fit them into their respective locations.

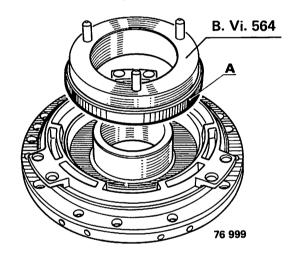
Check beforehand that the seals are a tight fit in the brake bellhousing bores.

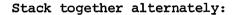
Fit the 'O' ring between the freewheel bearing and the location for Fl.

Fit the Fl piston to its bore, taking care not to damage the seals.

Fit mandrel (A) from tool B.Vi.564 to the freewheel bearing in order to line up the assembly correctly.

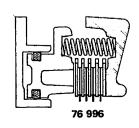


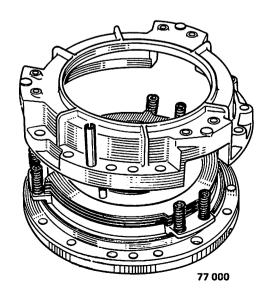




- the plain discs 1,5 mm (.059") thick,
- and lined discs.

Fit the six springs into their housings and cap the whole assembly with the Fl bearing.



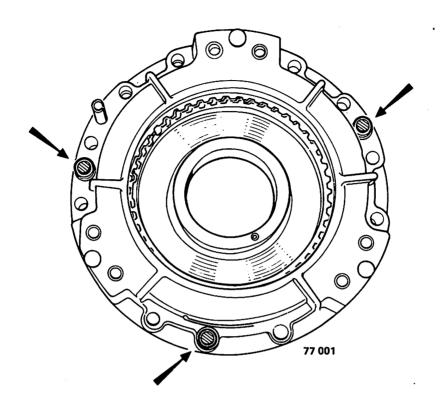




Re-assembly



4139

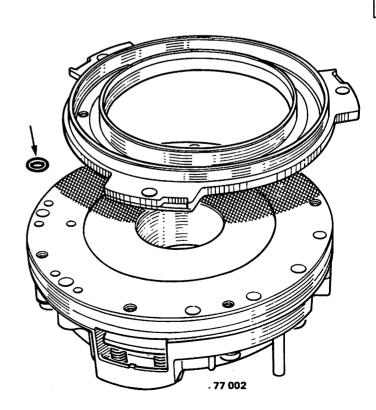


Screw up the three bolts securing the Fl assembly to the freewheel bearing and remove the aligning tool.

Turn the assembly over and rest it on the Fl bellhousing.

Insert the 'O' ring between the freewheel bearing and F2 bore.

Fit the F2 piston into its bore taking care not to damage the seals.





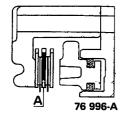


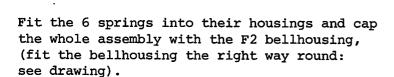
T.A. 4139

Place the aligning mandrel (B) from tool B.Vi.564 in the freewheel bearing.

Stack alternately:

- plain disc 1,5 mm (.059") thick,
- lined disc,
- the wave-form disc (A) 2 mm (.079") thick, marked by two slots,
- lined disc,
- and a plain disc 1,5 mm (.059") thick.

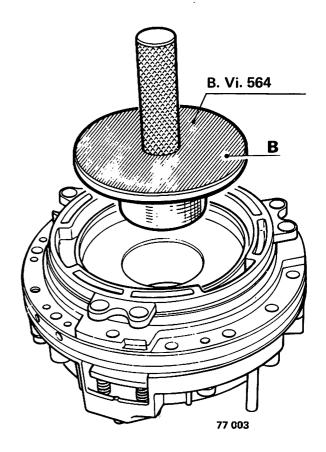


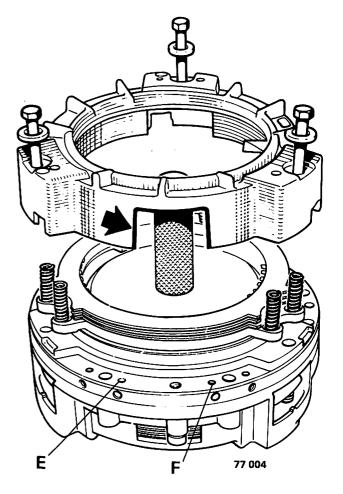


Screw up the 3 bolts securing F2 to the "F1 - freewheel carrier" assembly.

Remove aligning tool.

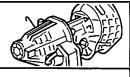
Using compressed air, check that the Fl and F2 components function correctly. Pass the air through hole E in the Fl piston and hole F in the F2 piston.







Re-assembling



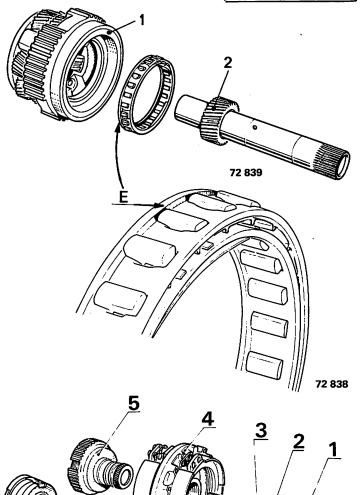
T.A. 4139

EPICYCLIC GEAR TRAIN

Fit the freewheel (flange (E) to the bottom of the bore) to epicyclic gear train (1).

Check that the inner thrust pad bearing plate is in the correct position.

Fit sunwheel Pl (2) so that it locates and holds the inner thrust pad.



MECHANISM ASSEMBLY

Start to assemble the E1 - E2 - F1 - F2 units after a compressed air test to test their functions.

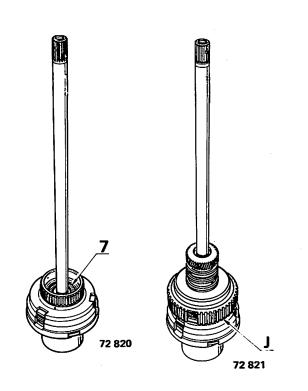
Place the El (6) assembly and turbine shaft (8) on a piece of tube about 100 mm (3 15/16") diameter.

Fit needle bearing thrust pad (7) between El (6) and P2 (5) (with needles facing towards P2).

Centralize the E2 discs (5) approximately and slide this assembly onto the splines in the El bellhousing.

Start by turning gently, without forcing, to avoid damaging the discs.

If all the discs are in position, a clearance J of about 4 mm (.157") should remain between El and E2.





T.A. 4139

Lubricate the E2 rings and their bearing surface in the freewheel bearing.

Centralize the F2 discs approximately and allow this brake assembly to drop down slowly onto E2.

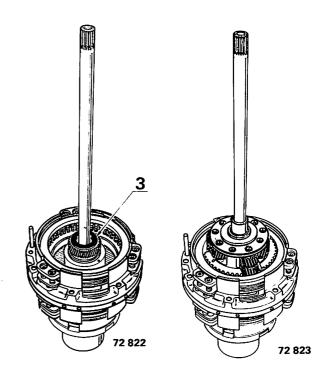
Proceed in the same way for E2.

Fit thrust pad (3) between P2 (5) and P1 (2) (needles facing towards P2).

Centralize the Fl discs and allow the Pl sunwheel carrier assembly to drop down slowly onto the Fl brake.

Start by turning, without forcing.

Then make sure that all the discs are correctly positioned.

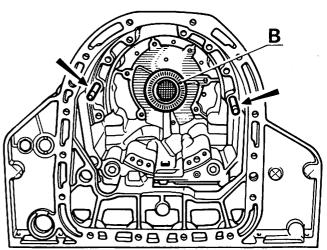


Fit thrust pad (B) and two 7 mm dia. studs, which will ease the entry of the mechanism into the gear casing.

Lubricate the oil seal location and the location for the freewheel bearing.

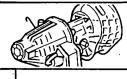
Make sure that no burr exists which might interfere with assembly.

Hold the turbine shaft vertical and offer up the assembly.



72 785-1

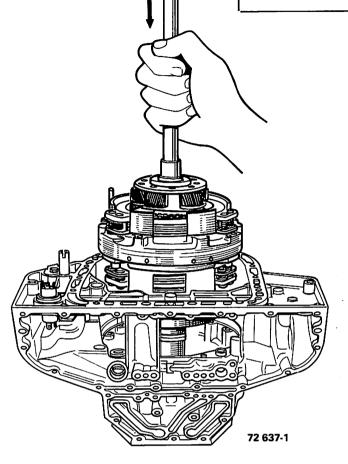
Re-assembling



T.A. 4139

Lower it gently, making sure that the freewheel bearing follows the El, E2 assembly correctly.

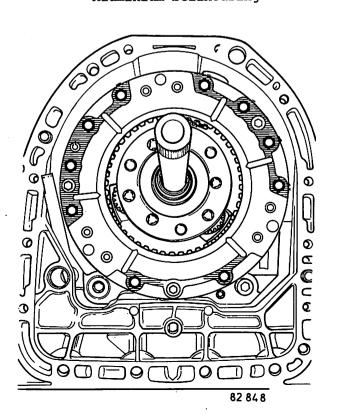
Then make sure that the freewheel bearing butts up well against its location.



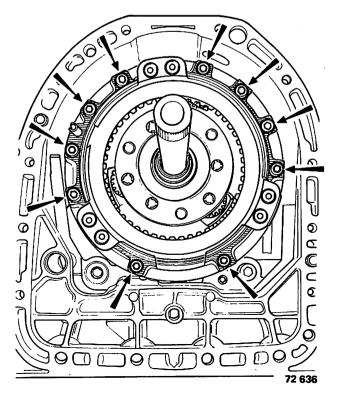
Take out the two studs.

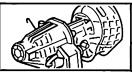
Fit the 10 bolts and torque tighten them.

Aluminium bellhousing



Cast iron bellhousing







4139 - ALL TYPES EXCEPT 40-41-50

Fitting the "Park" locking finger and quadrant.

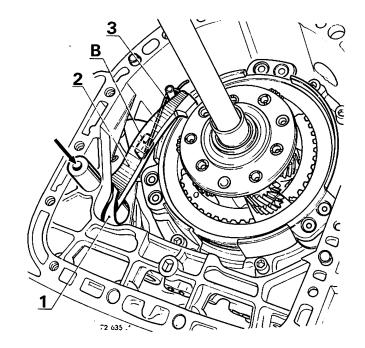
Fit:

- the "Park" locking finger return spring(3) on its peg.
- with "Park" finger (2) in between the 2
 sides of quadrant (1).

Offer up the assembly to the housing.

Slide in the shaft with threaded hole at top.

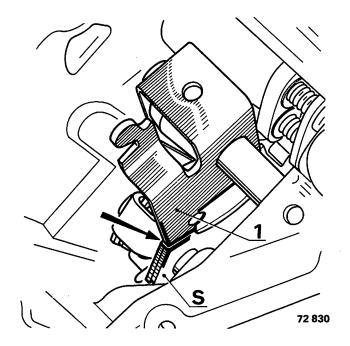
Slip the end of return spring (3) for the "Park" finger behind boss (B).



Mesh the two quadrants (1) and (S) together.

Both quadrants should be flush in the "Park" position as shown in the sketch (arrow).

If they are not flush, offset both quadrants by one tooth.





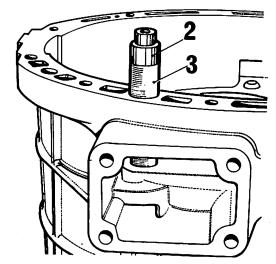
Re-assembling



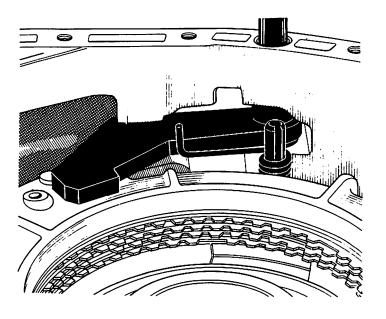
T.A. 4139 - 40 - 41 - 50

Fit:

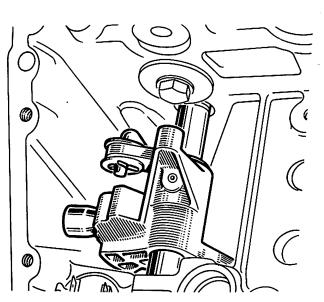
- the "Park" locking finger return spring on its peg,
- the "Park" finger,
- shaft (3) (threaded hole at top),
- and locating peg (2).



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81 524



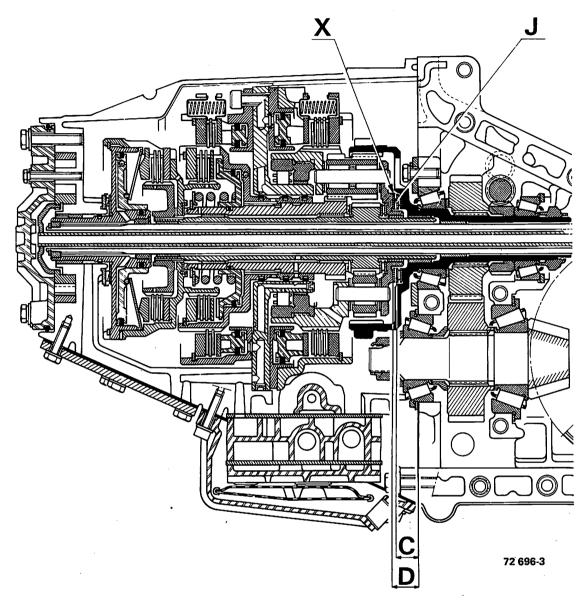
80 965

Adjusting end play



T.A. 4139

Adjusting end play



Operating clearance J should be between 0.4 and 0.8 mm (.016 and .032").

Adjustment consists of determining the total clearance and reducing it to within the acceptable tolerance by fitting a shim (X) of suitable thickness.

Measure the following to calculate the total clearance:

- dimension (C), between the needle bearing thrust plate and casing joint face,
- dimension (D), between the planet wheel carrier and casing joint face.

The difference between (D) and (C) gives the total end play (JT).

Adjusting end play

4139

Measuring dimension C

Fit the paper gasket to the casing and the needle roller thrust on the output shaft.

Measure dimension (A) between the output shaft and the top of the gasket using a straight edge and depth rule.

Then measure dimension (B) between the needle roller thrust and the output shaft.

Dimension (C) between the needle roller thrust and top side of the gasket is therefore: C = A - B.

Example:

therefore
$$A = 72,10 \text{ mm} (2.838")$$

 $B = 57,15 \text{ mm} (2.250")$
 $C = 14,95 \text{ mm} (.588")$

Measuring dimension D

Fit the needle thrust pad plate on the planet wheel carrier.

Then measure dimension (E) between the straight edge and the plate on the planet wheel carrier:

$$D = E - Y.$$

Y being the depth of the straight edge.

Example:

Overall clearance

The overall clearance JT between the planet wheel carrier and the needle roller thrust is equal to : JT = D - C.

Example:

$$D = 16,85 \text{ mm} (.664")$$

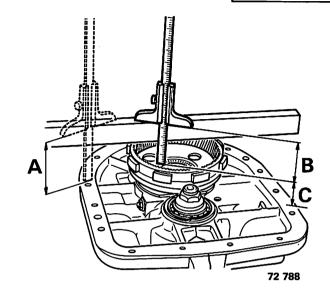
 $C = 14,95 \text{ mm} (.588")$

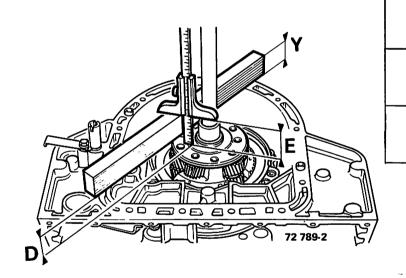
therefore JT = 1,90 mm (.075")

Assessing the shim thickness

The required operating clearance J (i.e. 0,6 mm) (.014") will be obtained by fitting a shim X which measures:

$$X = JT - O,6$$
 (.024")
Example ; $X = 1,90 - O,6 = 1,30 \text{ mm}$ (.051")





Thicknesses of shims:

In order to avoid any mistakes arising out of similarity with the needle thrust pad plate, the adjusting shims are brown and have a notch.

If the shim calculation works out at zero or over 2,5 mm (.100") for example, check:

- that all the needle thrust pads are correctly in position.
- the sunwheels are correctly meshed,
- the discs are correctly located on the splines.



Adjusting end play



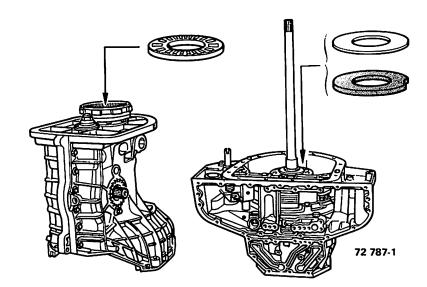
T.A. 4139

Assembling both housings and checking end play

Fit the needle thrust pad into its location on the output shaft in the differential case.

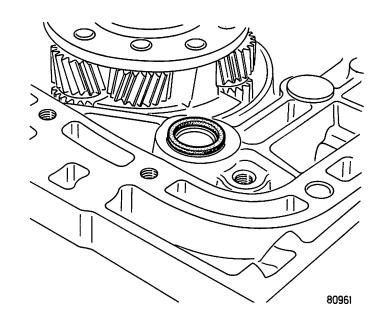
Fit into the mechanism casing, in the following order:

- the end play adjustment shim (with notch),
- and needle thrust pad plate.

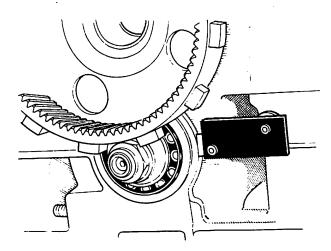


Before assembling both casings:

- make sure that the oil seal is in position (on the mechanism casing).



- make sure that the oil retaining plate is in position (on the final drive casing).







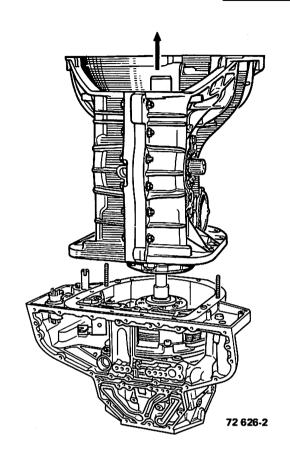
T.A. 4139

Also fit:

- 2 x 7 mm diameter studs to the mechanism casing,
- 2 locating dowels,
- and the paper gasket (dry).

Lubricate the turbine shaft and allow the differential casing to drop slowly down onto the mechanism casing.

Make sure that the output shaft slides down alongside the "Park" finger and that it meshes with the planet wheels.



Join the two casings together using a few correctly torqued bolts.

Fit the bottom closure plate with a new gasket (fitted dry).

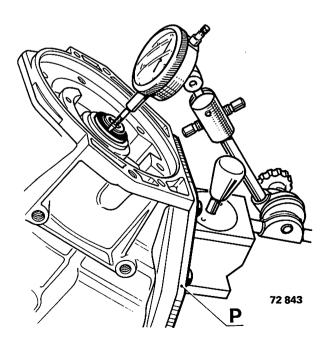
Torque tighten the closure plate bolts.

Fit the clock gauge bracket onto this closure plate and set the clock gauge needle touching the El hub.

Pull on the turbine shaft, set the clock gauge to zero, push the turbine shaft back again and read off the amount of end play on the clock gauge. It should be between 0,4 and 0,8 mm (.016" to .032").

Once the end play is correct, finish assembling the two casings, taking care to arrange the harness clips correctly.

Assemble the sealed junction box socket fitted with a new "O" ring dipped in recommended oil.





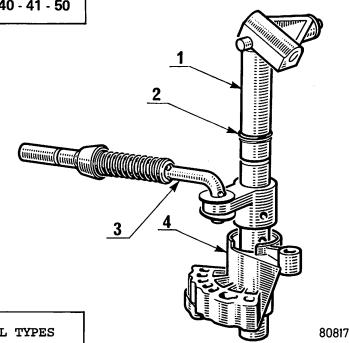
T.A. 4139 - 40 - 41 - 50

QUADRANT AND ENGAGEMENT SHAFT

Insert shaft assembly (1) partly (with
"O" ring (2) in place) to be able to fit:

- the assembled "Park" finger (3) to its hole,
- and quadrant (4).

Insert the rollpin.



4139 - ALL TYPES

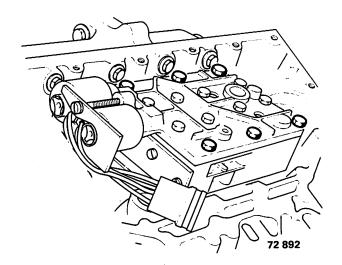
FITTING THE HYDRAULIC DISTRIBUTOR

The gasket faces on the casing and distributor must be absolutely clean and free from burrs.

Make sure that:

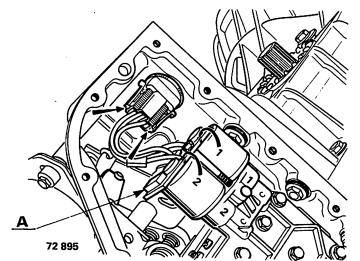
- both locating dowels are in position on the distributor body,
- both toothed quadrants are correctly meshed and flush when in the "Park" position.

Fit the distributor to the case, engaging the manual valve (V.M.) on the ball end; tighten the 6 securing bolts in sequence to the given torque.



Fit the sealed junction box plug and check that markings (1) and (2) on the distributor body, solenoid valves and plugs conform.

Fit the retaining magnet over the solenoid ball valve securing clamp.



80 962



MECHANISM CASING

Re-assembling



T.A. 4139

Lubricate the oil pump suction pipe seal (8) for gauze (7) and fit it to the end of the pipe.

Carefully push the suction pipe in so that no damage is done to "O" ring (9).

Fix the suction gauze with its 2 bolts.

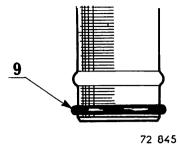
Check that the pump location is clean, lubricate the following and place in position:

- gear (6) note marks made on dismantling or place ring with chamfer (C) facing downwards into the casing),
- the involute gear (5),
- and pump drive shaft (4).

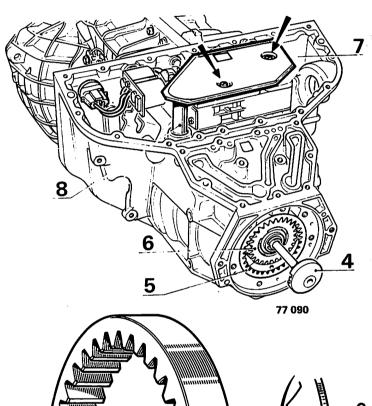
Fit:

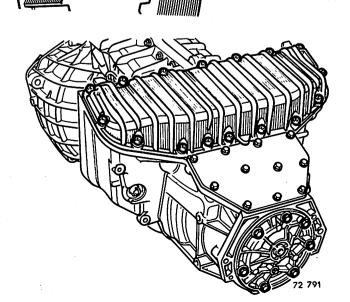
- the oil pump cover after lubricating its gasket and check the cover face condition,
- and sump with its gasket.

Check the pump shaft end play which should be between 0,35 and 0,80 mm (.014 and .031").





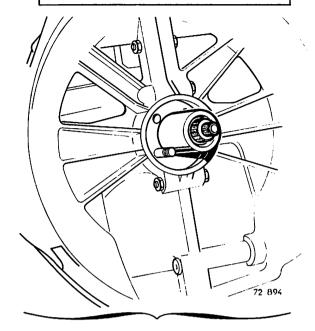






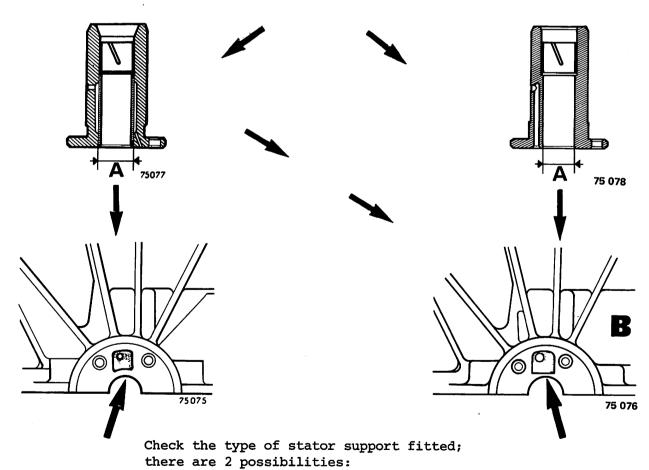


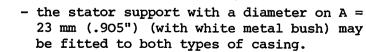
4139 EXCEPT 40-41-50



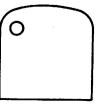
Stator support

0





- the stator support with a diameter of A = 21 mm (.827") may only be fitted to casing B.



Re-assembling



4139 - ALL TYPES

T.A. 4139

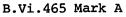
Fit one 7 mm diameter stud into one of the securing holes for the stator support to make it easier to fit.

Lubricate the turbine shaft and fit the stator support in position.

Remove the stud and torque tighten the 4 securing bolts.

Lubricate the converter oil seal, lay it on its locating chamfer and drive it in using tool B.Vi.465 mark A.

This tool automatically locates the seal at the correct depth.

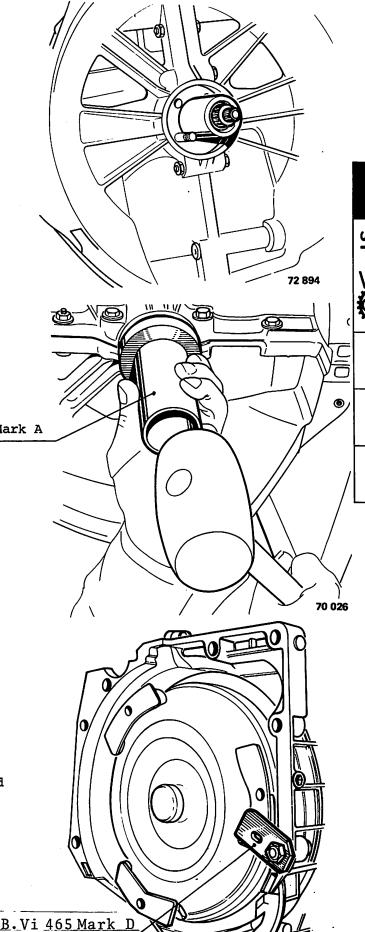


Fit the converter in position, having first lubricated the white metal sleeve, turbine shaft and oil pump shaft splines.

Fit retaining clamp B.Vi.465 mark D.

Re-assemble:

- the governor, with a new gasket smeared with Perfect-Seal,
- the vacuum capsule, with a new gasket smeared with Perfect-Seal,
- wiring harness,
- and dipstick.



79 858

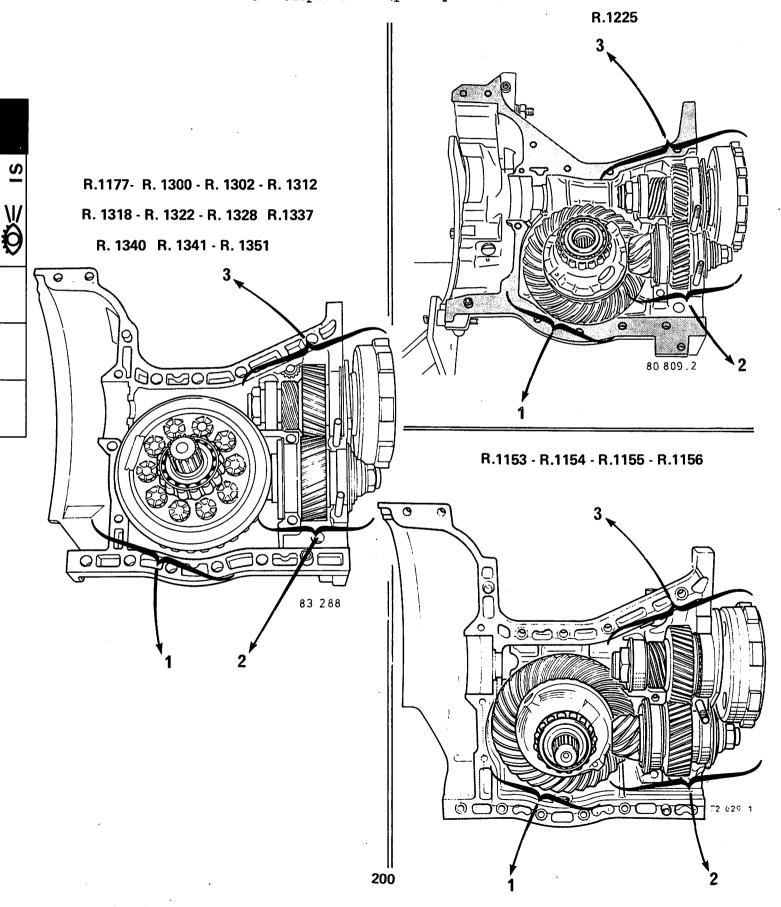
Specifications



4139

DIFFERENTIAL FITTING DIRECTION

- l Differential
- 2 Final drive pinion (secondary shaft)
- 3 Output shaft (primary shaft)



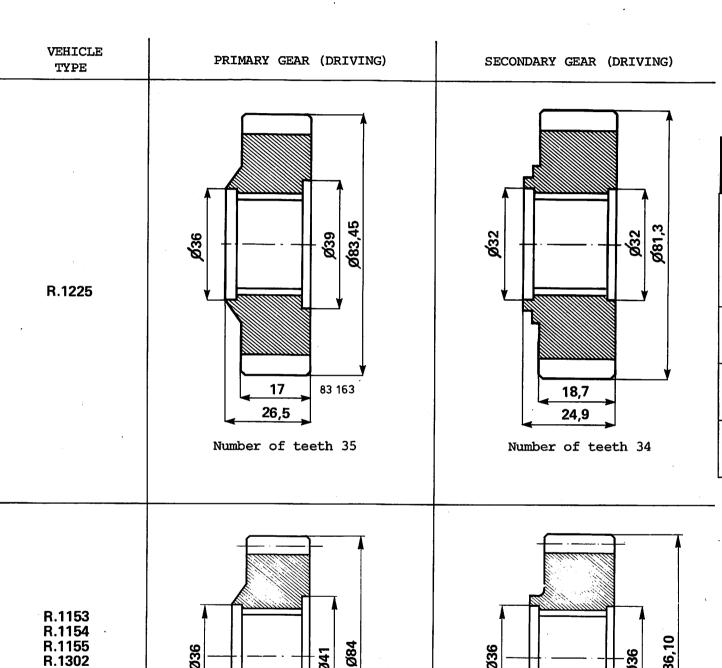


Specifications

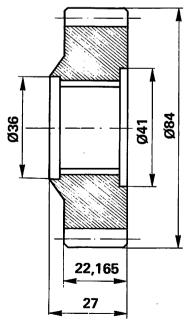


4139

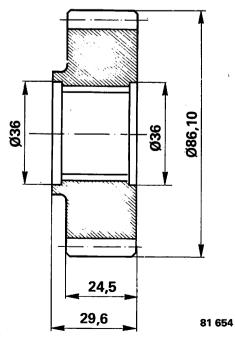
STEP-DOWN CLUSTER







Number of teeth 37



Number of teeth 38



Specifications



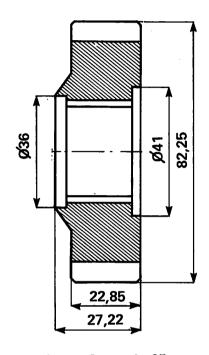
4139

VEHICLE TYPE

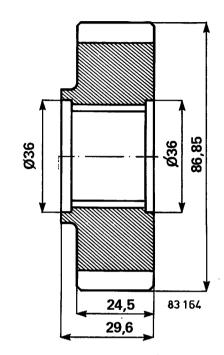
PRIMARY GEAR (DRIVING)

SECONDARY GEAR (DRIVING)

R.1156



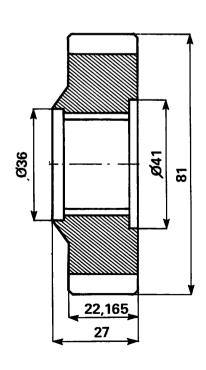
Number of teeth 37



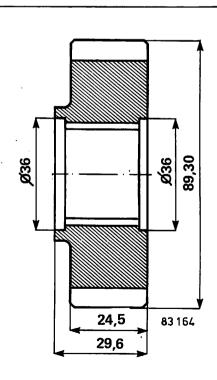
Number of teeth 39

Special feature: 2 grooves

R.1177 R.1300 R.1337



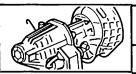
Number of teeth 35



Number of teeth 39

Special feature: 1 groove

202



Specifications



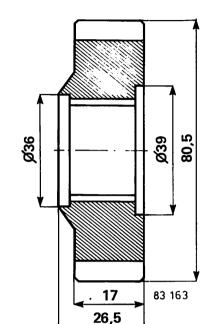
4139

VEHICLE TYPE

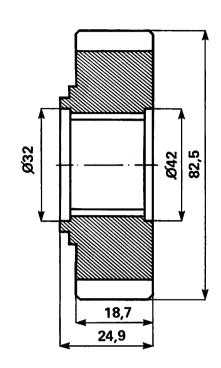
R.1340

PRIMARY GEAR (DRIVING)

SECONDARY GEAR (DRIVING)



Number of teeth 35



Number of teeth 36

Special feature: 2 grooves

ADJUSTMENTS TO BE MADE ON ALL TYPES OF 4139 AUTOMATIC TRANSMISSIONS

FINAL DRIVE PINION PROTRUSION

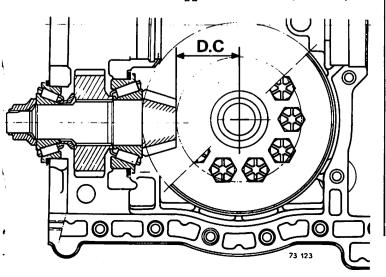
4139-00) 4139-10) 53 mm (2.087")

4139-40)

4139-41) non-adjustable

4139-50)

Other types: 56 mm (2.205")

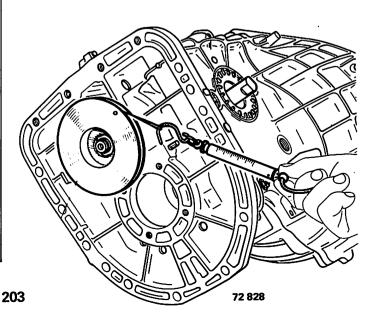


FINAL DRIVE PINION BEARING PRELOAD:

Re-used bearings : nil play

New bearings : 1 to 2 da N

(2 lb 4 oz to 4 lb 7 oz)





Specifications



4139

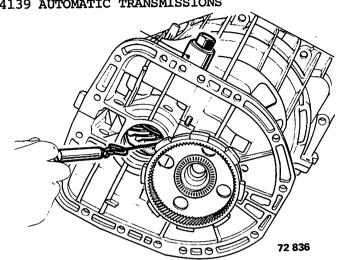
ADJUSTMENTS TO BE MADE ON ALL TYPES OF 4139 AUTOMATIC TRANSMISSIONS

DIFFERENTIAL BEARING PRE-LOAD

Re-used bearings : nil play

New bearings : 1 to 2 da N (2 lb 4 oz

to 4 lb 7 oz)



OUTPUT SHAFT PRE-LOAD

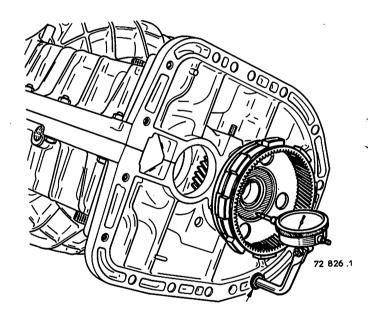
Re-used bearings : O to 0,03 mm (O to .0012")

play

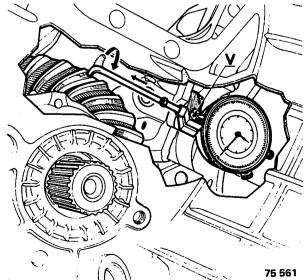
O to 0,03 mm (O to .0012")

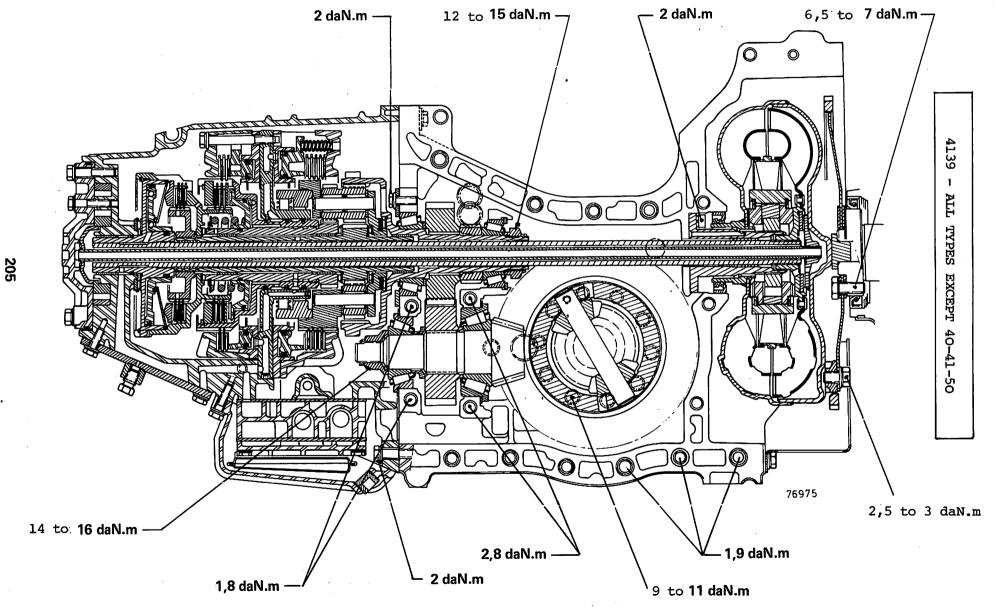
pre-load.

Ball bearings : non-adjustable.



CROWN WHEEL and PINION BACKLASH; 0,12 to 0,25 mm (.0047 to .010")





1,9 daN.m

206



FINAL Tightening torques DRIVE ASSEMBLY



1,9 daN.m 3 to 35 daN.m



Code 2260

Dismantling - Re-assembling - Adjusting

4139

SPECIAL TOOLS

Methods reference	Description	Essential	Useful	Specifically for vehicle
B. Vi. 16-01	Transmission support			
B. Vi. 28-01	Extractor			
B. Vi. 31-01	Drift	0		
B. Vi. 39	Drift			
B. Vi. 48	Jaws			
B. Vi. 377	Differential ring nut wrench			
B.Vi.465 mark C	Converter oil seal extractor			
B. Vi. 489-03	Clock gauge bracket			
B. Vi. 489-17	Clock gauge extension			
B. Vi. 489-19	Box of special auto- transmission tools			
B.Vi.807	Differential ring nut wrench	·		
B.Tr.02	Clamp			
Rou.15-01	Thrust pad			
T.Ar.65	Extractor	·		
T.oy	WILMONDA extractor			



Dismantling



4139

The box of special tools B.Vi.489-19 enables the automatic transmission to be overhauled completely.

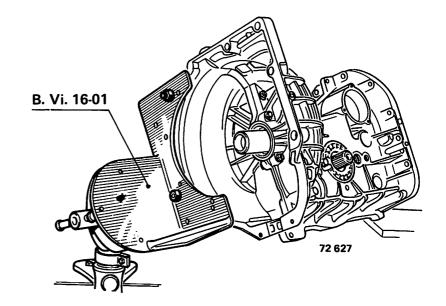
DISMANTLING

A covered bench (rubber or thick plastic sheet) must be used when dismantling and handling the component.

Disconnect the final drive casing from the mechanism casing when the final drive assembly only requires attention (for example: for a bearing change).

Differential casing

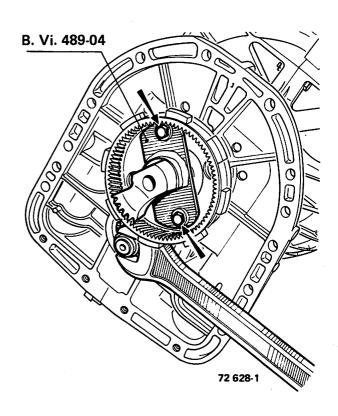
Use support B.Vi.16-Ol when dismantling or re-assembling the differential casing.



Remove the thrust plate fixing bolts for the output shaft bearing.

Use two longer bolts and fit locking sector B.Vi.489-04 in position.

With the output shaft now locked, unlock and unscrew the final drive pinion nut.





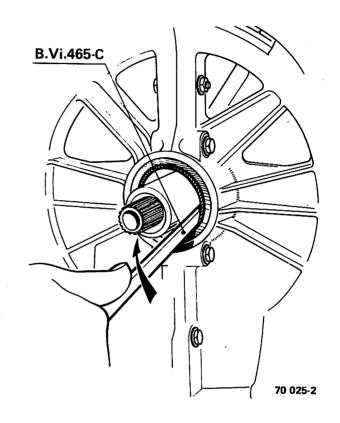
Dismantling



4139

Remove:

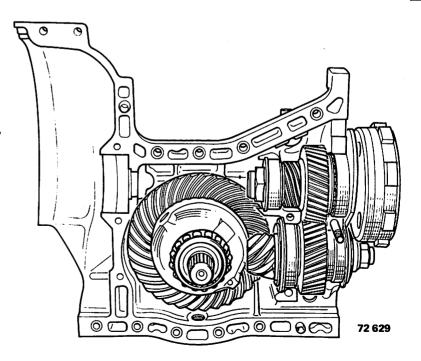
- the converter oil seal using tool B.Vi.465 mark C (use the head of a stator support bolt as a fulcrum and lever up and remove the seal).
- and the 4 stator support fixing bolts.



Unscrew the assembly bolts holding the half-casings and tap the latter with a rubber mallet to separate them.

Remove:

- the output shaft
- differential
- and final drive pinion.



Dismantling

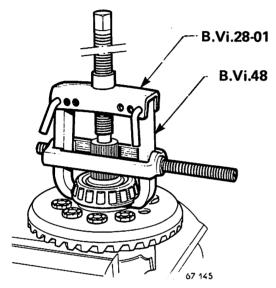


DIFFERENTIAL

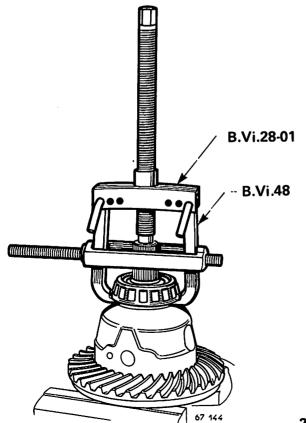
4139 - ALL TYPES EXCEPT 40-41

- remove 2 opposing crown wheel fixing bolts.
- extract the bearing on the crown wheel side.

Use extractor B.Vi.28-Ol fitted with jaws B.Vi.48.

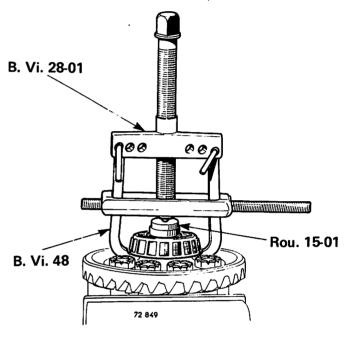


Extract the bearing on the opposite side using extractor B.Vi.28-Ol fitted with jaws B.Vi.48.

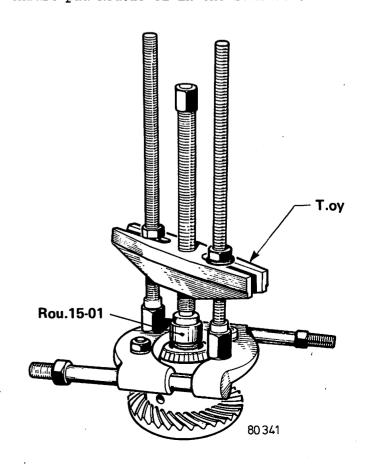


4139 40-41

Extract the bearing on the crown wheel side using extractor B.Vi.28-Ol fitted with jaws B.Vi.48 and thrust pad Rou.15-Ol.



Extract the bearing on the opposite side using the WILMONDA Toy extractor with thrust pad Rou.15-Ol in the sunwheel.





Dismantling



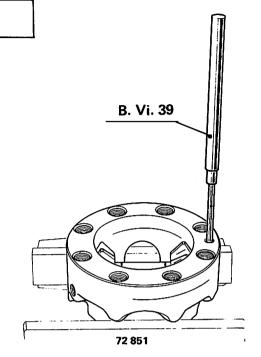
4139 - ALL TYPES

DIFFERENTIAL CASING

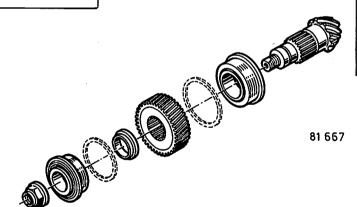
Unscrew the crown wheel fixing bolts (self-locking bolts which cannot be re-used).

Punch out the planet wheel shaft rollpin using drifts B.Vi.31-Ol or B.Vi.39.

Separate the various parts.



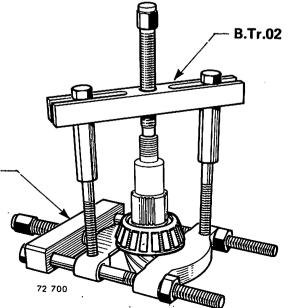
4139 except 40-41-50



FINAL DRIVE PINION

Remove:

- the nut
- the bearing
- bearing preload shims (note thickness if same crown wheel and pinion are to be used)
- spacer
- driven gear
- piston protrusion setting shims (note thickness if same crown wheel and pinion T.Ar.65 are to be fitted)
- the bearing using extractor T.Ar.65 fitted with bar B.Tr.02.





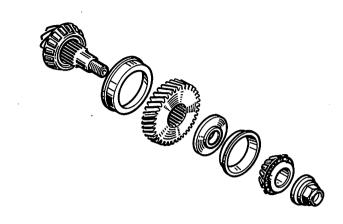
Dismantling



4139-40-41-50

Remove:

- the nut
- the bearing
- bearing pre-load shims
- driven gear
- the bearing under the pinion head using the WILMOND Toy extractor.



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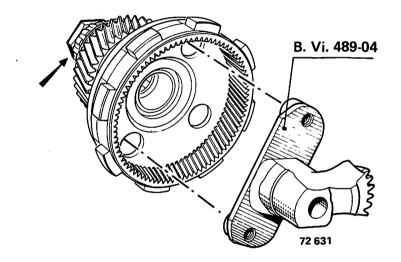
4139 - ALL TYPES

OUTPUT SHAFT

Ball bearing assembly:

Grip tool B.Vi,489-04 in a vice.

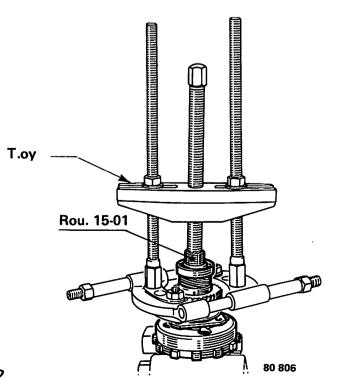
Fit the output shaft over it, unlock and remove the nut on the end of the shaft.



Using the WILMONDA extractor and thrust pad Rou, 15-Ol,

Remove:

- the 1st. bearing
- speedometer drive worm
- primary step-down drive gear
- and the spacer.





FINAL DRIVE ASSEMBLY

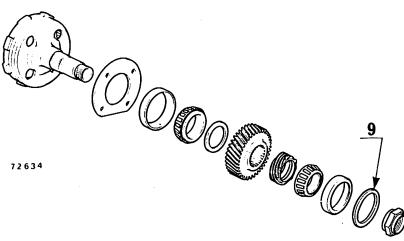
Dismantling

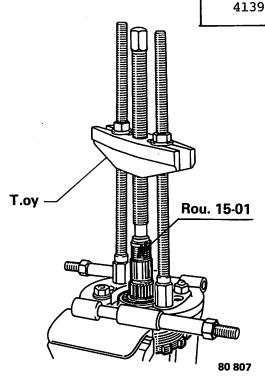
Extract:

- the second bearing using the WILMONDA (Ref.Toy) extractor and thrust pad Rou.15-O1).
- and the thrust pad.

Taper roller bearing assembly:

Remove and keep the bearing preload setting shims.





CLEANING - CHECKING

CLEANING

The use of trichlorethylene is prohibited as this would contaminate the oil seals.

Do not use rags for cleaning as they leave traces of fluff behind.

Use white spirit or a degreasing agent except on the oil seals and wipe off with a non-fluffy cloth.

Use compressed air and direct it particularly into all holes, oil feed and lubrication channels.

Lubricate all components with recommended oil immediately after cleaning.

Converter

No liquid other than the recommended oil must be allowed to enter the converter.

For cleaning purposes, allow the converter to drair for a long period, then pump out the remaining oil from the turbine hub using a syringe.

CHECKING

Check the condition of the final drive assembly:

- crown wheel and pinion teeth
- differential and final drive pinion bearings
- the step-down driven gear.

On the output shaft, check:

- the bearings
- governor drive worm
- step-down drive gear
- involute teeth on output shaft
- both white metalled bushes.

Also make sure that the following are serviceable:

- all joint faces
- stator support housing.
- casing breather
- differential ring nut threads.

Change both step-down gears if one is worn.

FINAL DRIVE ASSEMBLY



Crown wheel and pinion matching



4139

MATCHING

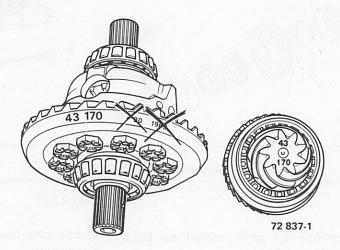
The crown wheel and pinion are lapped together in manufacture.

They must therefore be considered as a single unit.

If either one of the parts has to be changed then both must be changed together.

A common reference mark is etched on the crown wheel and on the pinion.

Example: 43-170 (43rd set manufactured on day 170 in manufacturing year).



Pay no attention to any other numbers on the crown wheel.

Exceptional case

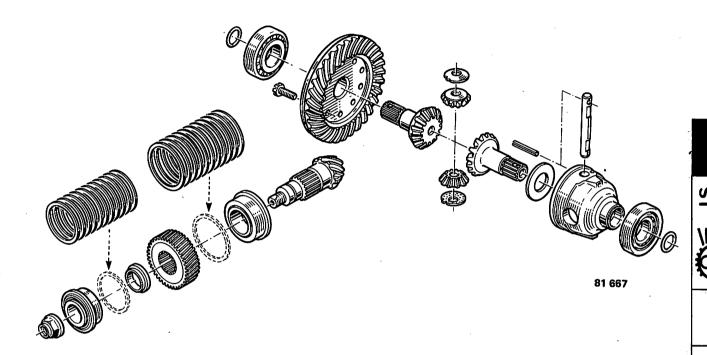
There may be a third figure on the crown wheel pinion face (Ex: 20).



This means that the pinion protrusion on the final drive concerned must be adjusted to nominal size A + 20/100 mm (A + .008").



4139 except 40-41-50

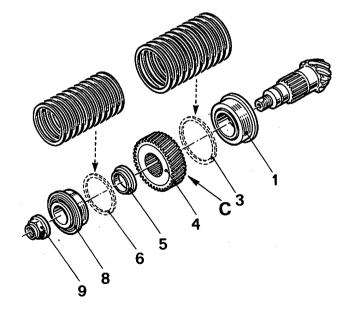


FINAL DRIVE PINION

Press on taper roller bearing (1).

Then fit:

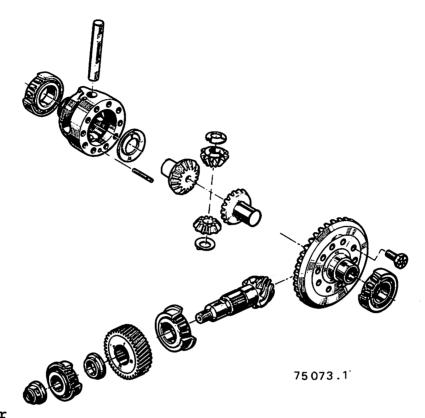
- shim pack (3) for the final drive pinion protrusion equal to the old value if the old crown wheel and pinion are being refitted or a shim pack 1,10mm (.044") thick if fitting a new crown wheel and pinion.
- step-down driven gear (4) (C) facing final drive pinion.
- spacer (5) (larger diameter facing final drive pinion)
- shim pack (6) for the final drive pinion protrusion equal to the old value if the old crown wheel and pinion are being refitted or a shim pack 1,20 mm (.047") thick if fitting a new crown wheel and pinion
- bearing (8)
- and locknut (9) without tightening at this stage.



81 667



4139-40-41-50



FINAL DRIVE PINION

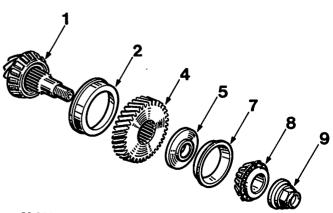
Press on taper roller bearing (1).

Then fit in this order:

- bearing outer track ring (2)
- step-down driven gear (4) with its flange facing the final drive pinion.
- pre-load setting shim (5) (refit the same shim if the old crown wheel and pinion are to be refitted)
- 2nd. bearing outer track ring(7)
- bearing (8)
- and nut (9) (do not tighten at this stage).

Reminder: the pinion protrusion cannot be adjusted on these automatic transmissions.

- 1 Bearing
- 2 Bearing outer track ring
- 4 Step-down driven gear
- 5 Setting shim
- 7 Outer track ring
- 8 Bearing
- 9 Nut

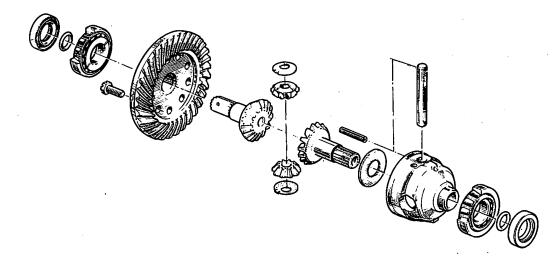


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4139 except 40-41

DIFFERENTIAL



77024

Fit the following into the differential housing:

- the bakelite impregnated washer, with oil groove facing sunwheel: use the washer 1,96 to 2 mm (.077 to .079") thick or the washer 2,03 to 2,07 mm (.080 to .082") thick if the sunwheel and planet wheels backlash is excessive
- one sunwheel (dip it in recommended oil)
- the planet wheels and thrust washers (locking tab in hole in housing).

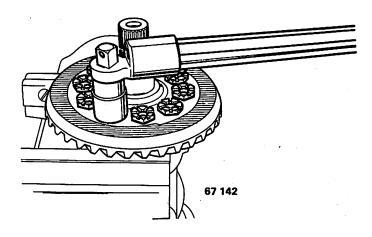
Slide the planet wheel shaft in (align the hole in the shaft with that in the housing).

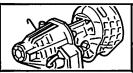
Insert the rollpin: punch it in using drift B.Vi.31-Ol or B.Vi.39.

Dip the 2nd. sunwheel in recommended oil and place it in the crown wheel.

Assemble the crown wheel to the differential housing using new self-locking bolts.

Torque tighten the bolts.

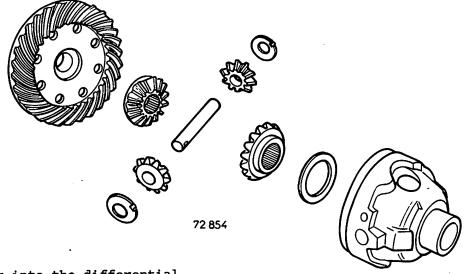






4139-40-41

DIFFERENTIAL



Fit the following into the differential casing:

- the bakelite impregnated washer with oil groove facing sunwheel: use the washer 1,46 to 1,50 mm (.057 to .059") thick.

(the washer 1,53 to 1,57 mm (.060 to .062") thick will only be used if the sunwheel and planet wheels backlash is excessive).

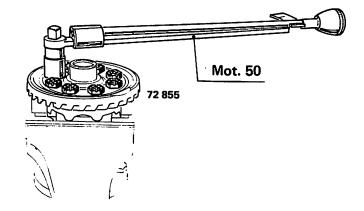
- one sunwheel (dip it in recommended oil)
- the planet wheels and thrust washers (locking tab in hole in housing).
- Slide the planet wheel shaft in (align the hole in the shaft with that in the housing).
- Insert the rollpin: punch it in about 5 mm inside the housing using drift B.Vi.39.

Dip the 2nd. sunwheel in recommended oil and place it in the crown wheel.

Assemble the crown wheel to the differential housing using new self-locking bolts.

Torque tighten the bolts.

The differential may be slightly hard to turn initially.



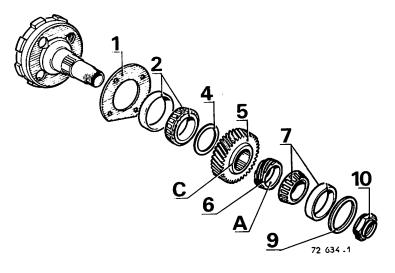


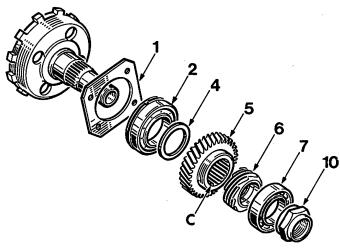
4139

OUTPUT SHAFT:

Assembly with taper roller bearings

Assembly with ball bearings





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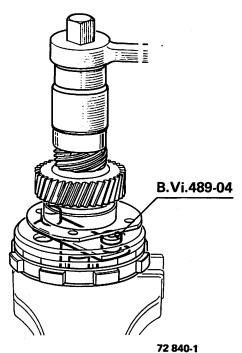
- 1 Thrust plate
- 2 Bearing
- 4 Spacer
- 5 Step-down drive gear
- 6 Speedometer worm
- 7 Bearing
- 9 Setting shim
- 10 Nut

Fit the following to the output shaft in the order shown:

- thrust plate (1)
- bearing (2) (flange facing thrust plate)
- spacer (4)
- step-down drive gear (5) (flange (C) facing speedometer drive worm)
- speedometer drive worm (6) (smaller diameter bore (A) facing the nut)
- bearing (7)
- setting shim (9) if necessary
- nut (10)

Place tool B.Vi.489-04 in a vice, align the output shaft to this tool and torque tighten the nut.

Lock the nut by squeezing the flange over the flat on the shaft.





Re-assembling - Checking



4139 except 40-41-50

PREPARATIONS FOR CHECKING PRE-LOAD AND PINION PROTRUSION

Fit the half-housing (governor side) to support B.Vi.16-Ol.

Fit the differential bearing track rings and ring nuts into the half-housings (the ring nuts must be clean and smeared with "CAF 33" paste).

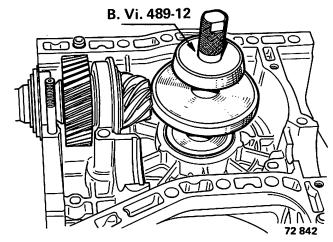
The oil seals of the 4139-23-50 transmissions will be fitted after adjustment has been made.

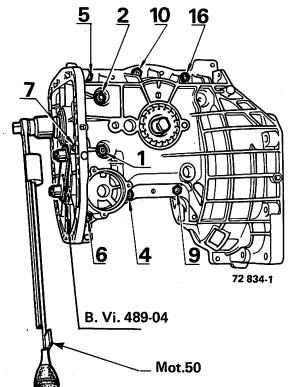
Lightly lubricate the tapered faces on tool B.Vi.489-12 for setting the pinion protrusion and place it and the final drive pinion in the half-housing.

Fit the other half-housing and only screw up the marked bolts shown.

Hold the final drive pinion and torque tighten the nut using tool B.Vi.489-04.

Torque tighten the bolts.





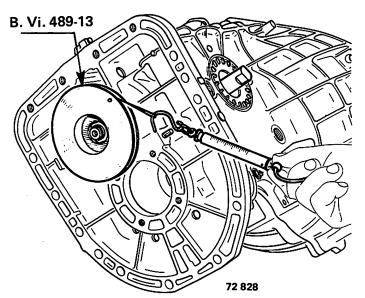
CHECKING

Re-used bearings

Rotate the final drive pinion several times to settle the bearings. It should revolve freely without endplay.

New bearings

Using a spring balance and tool B.Vi.489-13, measure the pre-load, that is to say, the effort necessary to keep the final drive pinion turning which should be between 1 and 2 da N (2 lb 4 oz - 4 lb 7 oz).



FINAL DRIVE ASSEMBLY

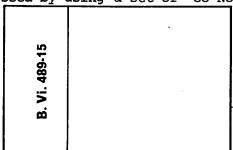
Re-assembling - Checking

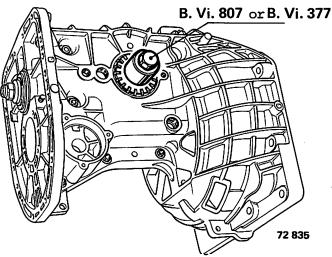


Screw the ring nuts in using tool B.Vi.807 or B.Vi.377 to push the bearing track rings towards the final drive pinion protrusion tool.

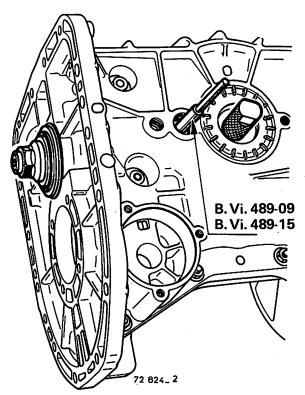
Tighten gradually and turn the tool so that it locates correctly.

The final drive pinion position may be assessed by using a set of "Go-No-Go" gauges.





Position the gauge correctly when measuring: the gauge shoulder should not touch the final drive pinion end face.



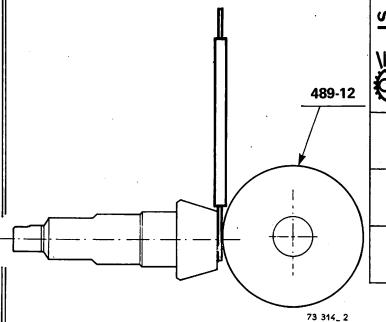
4139 except 40-41-50

Find the gauge which may be inserted freely and without play between the final drive pinion and tool B.Vi.489-12.

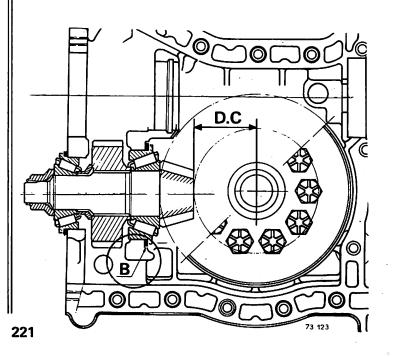
Example:

- Tool radius + gauge diameter = 49 mm + 6,85 mm = 55,85 mm (1.9291 + .269" = 2.198")

If the pinion protrusion is 56 mm (2.2047")
56 mm - 55,85 mm = 0,15 mm
(2.2047 - 2.1989"= .0058")
Remove 0,15 mm of shim at B.

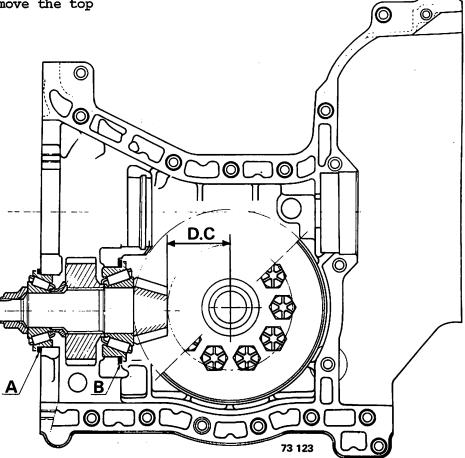


The pinion protrusion is correct when "Go" gauge 6,95 mm dia. enters and "No-Go" gauge 7 mm dia. cannot enter.



4139 except 40-41-50

Once the position of the final drive pinion and the preload value of the bearings are known, unscrew the final drive pinion nut and remove the top half-casing.



There are three possibilities at this point:

A - Incorrect pre-load

Correct pinion protrusion

Reduce or increase the thickness of shim A.

Recheck both the bearing pre-load and pinion protrusion after reshimming.

B - Incorrect pinion protrusion

Correct pre-load

Pinion protrusion higher than nominal: increase thickness of shim B and reduce thickness of shim A by the same amount.

Pinion protrusion less than nominal: reduce thickness of shim B and increase thickness of shim A by the same amount.

The total of shim thicknesses A + B must not change.

Check the new value after adjusting the pinion protrusion.

C - Incorrect pinion protrusion and incorrect pre-load

Adjust the pre-load by altering the thickness of shims A or B to get as near as possible to the correct pinion protrusion adjustment.

Recheck bearing pre-load after modification. If satisfactory, refer to paragraph B.

FINAL DRIVE ASSEMBLY

Re-assembling - Adjusting



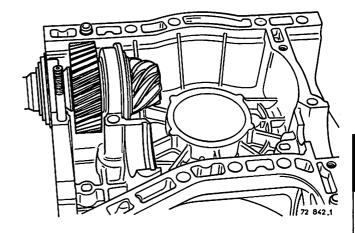
4139-40-41-50

ADJUSTING THE FINAL DRIVE PINION (PRE-LOAD)

There is no pinion protrusion adjustment.

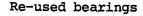
Fit the half-casing (governor side) to support B.Vi.16-O1.

Fit the final drive pinion into the half-casing.



Fit the other half-casing and screw up the bolts that are marked in the drawing on the right.

Prevent the final drive pinion from moving using tool B.Vi.489-O4 and torque tighten its nut.

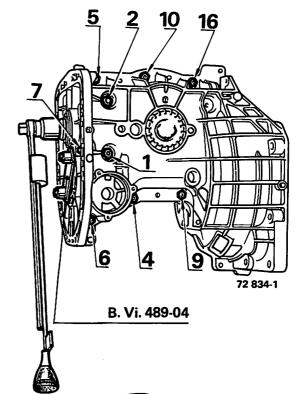


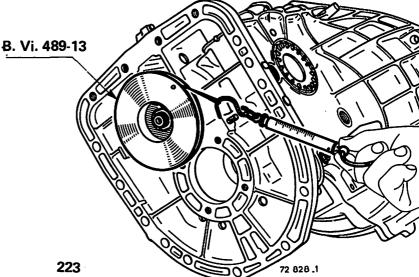
Turn the final drive pinion several complete turns to settle the bearings. The pinion should turn freely without play with its re-used bearings in position.

New bearings

Using a spring balance and tool B.Vi. 489-13, measure the pre-load, that is the load required to turn the final drive pinion evenly and continuously. This pre-load should be 1 to 2 da N (21b 4oz to 41b 7oz).

Adjust by altering the thickness of the shim between the taper roller bearing on the mechanism casing side and the step-down driven gear.









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ADJUSTING THE DIFFERENTIAL AND OUTPUT SHAFT PRE-LOADS

When the primary shaft is fitted with taper roller bearings, it is preferable to carry out the preload operations for the differential and output shaft together. Make sure that the differential is fitted the correct way round (see page 200).

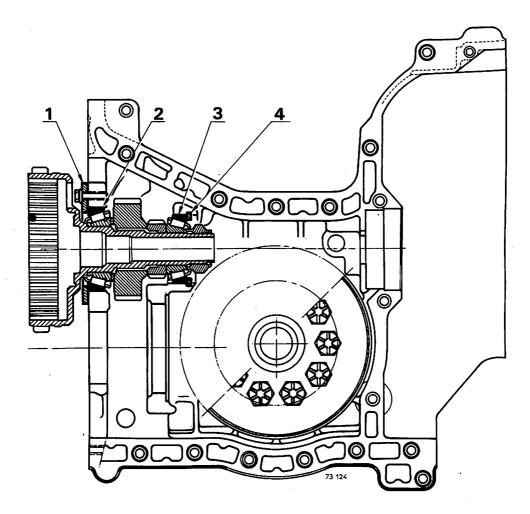
When the primary shaft is fitted with ball bearings, it is only necessary to adjust the differential pre-load. Make sure that the differential is fitted the correct way round (see page 200).

OUTPUT SHAFT

Adjustment of output shaft bearings:

Re-used bearings: 0,03 mm (.0012") max.

New bearings : 0 to 0,03 (0 to .0012") pre-load



Fit inner bearing outer track ring (3) up against setting shim (4).

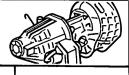
Fit outer bearing track ring (2) so that it is slightly proud of the casing.

Fit the top half-casing and screw up the bolts.

Tighten the 4 thrust plate bolts (1) to push bearing outer track ring (2) into position.

Tap the end of the output shaft lightly with a rubber hammer to locate the inner bearing.

Tighten the half-casing assembly bolts.



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Set up a clock gauge so that the plunger rests on the end of the output shaft (support B.Vi.489-03).

Fit a rubber washer (R) under the support so as not to mark the casing joint face.

Measure the end play.

Alter the thickness of shim (4) to obtain the correct end play.



Adjust the differential bearing pre-load by screwing in the ring nuts using wrench B.Vi.377 or B.Vi.807.

(adjust by pushing the crown wheel away from the final drive pinion).

Rotate the crown wheel several times to settle the bearings.

RE-USED BEARINGS

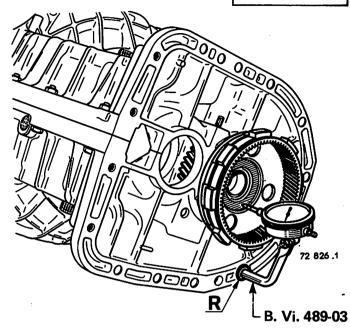
The differential should revolve freely without play.

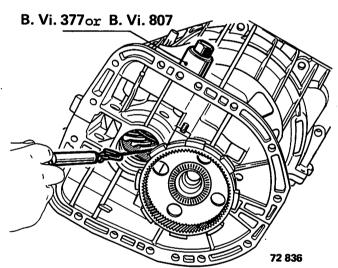
New bearings

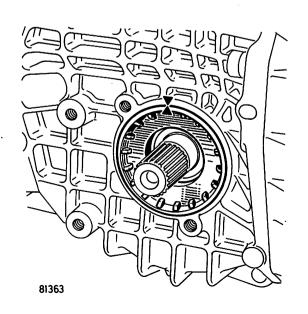
Using a screwdriver, guide a piece of cord fitted with a hook through the final drive pinion locating bore and wrap the cord round the differential housing as near to the crown wheel as possible.

Using a spring balance, measure the load required to keep the differential housing turning. This load should be between 1 and 2 da N (21b 4oz and 41b 7oz).

Then mark the position of the ring muts in relation to their half-casings.









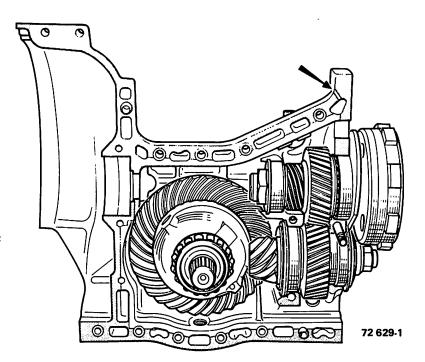


4139

- Remove the half-casing assembly bolts and separate the casings.
- Fit into the half-casings:
 - . the differential assembly (make sure it is the correct way round) (see page 200).
 - . the final drive pinion.
 - . and the output shaft.

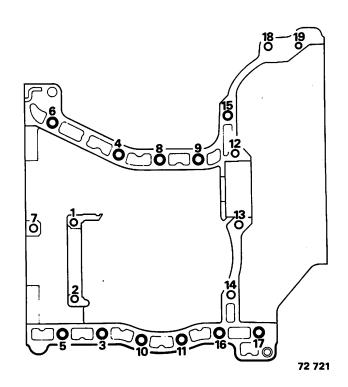
Smear the half-casing joint faces with Curtylon paste along their outer edges: remember to keep the breather channel (if fitted) (arrow) unobstructed in one of the half-casings.

Assemble the half-casings using new washers and hand tighten the nuts and bolts only at this stage.



4139 except 40-41-50

Tighten the half-casing assembly nuts and bolts in the order shown.

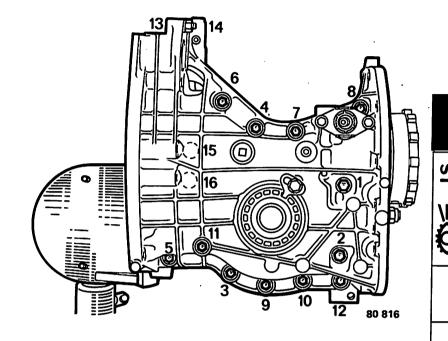






4139-40-41-50

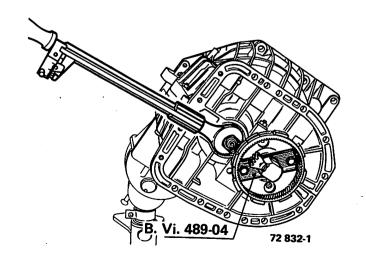
Tighten the half-casing assembly bolts in the order shown.

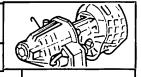


4139 - ALL TYPES

Use locking sector B.Vi.489-04 to prevent the output shaft from turning.

Tighten the final drive pinion nut without using the output shaft bellhousing a fulcrum point: use an o.e. wrench fitted to the torque wrench.





4139

CROWN WHEEL AND PINION BACKLASH

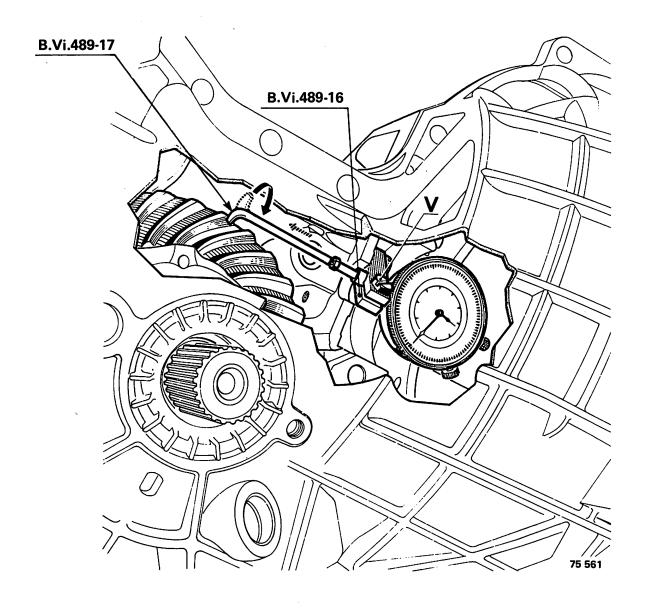
Rotate the output shaft several times to settle the bearings.

Tighten clamping screw (V) on bracket B.Vi.489-16 to make the clock gauge a little harder to turn (remove clock gauge).

Fit the bracket to the casing.

Screw extension B.Vi.489-16 (see sketch) (for clock gauge with 3 mm dia. tip and 0,60 mm pitch) or B.Vi.489-17 (for clock gauge with 2,5 mm tip and 0,45 mm pitch) to the clock gauge and fit the assembly to the bracket (pointer upwards). With the dial gauge in position, turn it so that the pointer contacts a crown wheel tooth.

The backlash should measure: 0,12 to 0,25 mm (.0047 to .010"). Take three measurements spaced around the crown wheel.







FINAL DRIVE ASSEMBLY

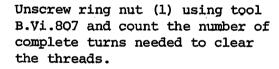
Re-assembling - Adjusting



4139-23-50

Once adjustments to the final drive have been made, the oil seals may be fitted to the differential ring nuts.

Mark the position of the nuts in relation to their respective half-casings.

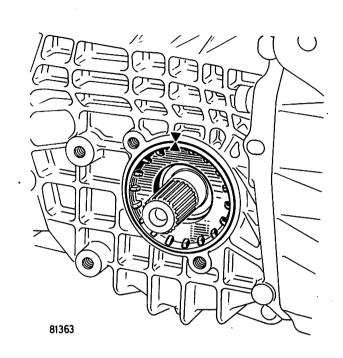


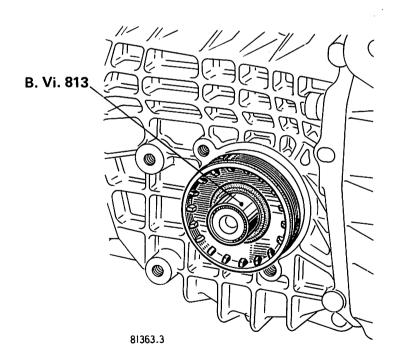
Fit the "O" ring and lip-type oil seal.

Smear the threads round the differential ring nut with CAF 33 paste.

Fit sleeve B.Vi.813 over the sunwheel splines to protect the oil seal lip.

Now screw the ring nut back the same number of turns noted on the removal until the marks are in line.

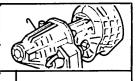




4139 - ALL TYPES

Fit a lockplate to each ring nut.





4139

It is essential to unscrew one of the ring nuts and screw up the other ring nut by equal amounts in order to retain correct pre-loading of the differential bearings when altering the position of the crown wheel.

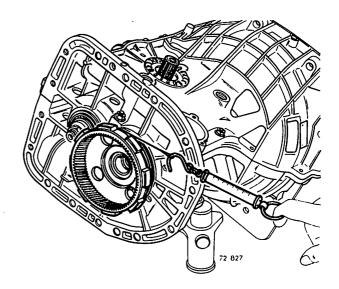
Once the backlash is correct, lock the final drive pinion nut and differential ring nuts.

Checking



When all adjustments are complete, a check may be made on the load required to rotate the mechanism by a steady pull on the output shaft. This should be 1,5 to 3,5 da N (31b 5oz to 71b 1loz).

Then assemble the mechanism and final drive casings after checking and adjusting the transmission operating clearance as explained on page 192.



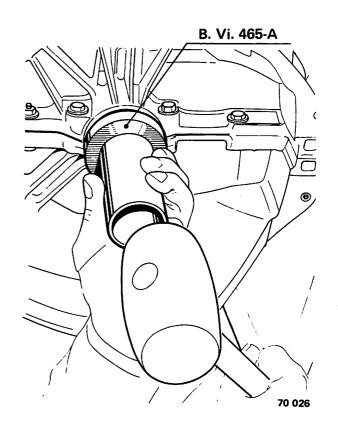
Check the condition of the smooth part of the stator support.

Lightly lubricate the seal, fit it over the chamfer then drive it into position using inserting tool B.Vi.465, mark A. Tap gently.

This tool sets the depth of the seal automatically.

Lubricate the oil seal bearing face with recommended oil and refit the converter.

Fit the retaining plate.



Driving - Towing (Breakdown recovery)



4139

DRIVING

The automatic transmisssion is lubricated under pressure only when the engine is running.

It is essential therefore to follow the recommendations below otherwise serious damage to the transmission may occur:

- Never freewheel with the ignition switched off (for example: downhill).
 We cannot stress too highly the danger in this practice.
- Never push the car (for example: to reach a filling station) unless the precautions described below under "Towing (Breakdown Recovery)" are taken beforehand.

Furthermore, the front wheels will not drive the engine (engine braking) unless the engine itself is running so a vehicle with automatic transmission cannot push or tow started.

TOWING (BREAKDOWN RECOVERY)

The front wheels must be raised off the ground (front wheel lift). In exceptional circumstances, towing may take place with the front wheels on the ground but only in the following conditions:

- 1 Add an extra 2 litres (4 Imp. pts.) of ELF Renaultmatic D2 or Mobil ATF 220 oil to the transmission.
- 2 Do not exceed a speed of 30 km/h (18 m.p.h.) or a distance of 50 km/h (30 miles) when towing.

Remember to drain off the surplus oil after towing.

Code 9536

Specification



RENAULT 12 (R. 1177 - R. 1337)

TOWING WEIGHTS (FRANCE) *

A caravan or trailer of the following total towing weights may be towed after an oil cooler has been fitted to the automatic transmission hydraulic circuit:

•	Unbraked		Braked	
	without oil cooler	with oil cooler	without oil cooler	with oil cooler
R.1177	450 kg (992 lbs)	460 kg (1014 lbs)	450 kg (992 lbs)	1000 kg (2205 lbs)
R.1337	450 kg (992 lbs)	475 kg (1047 lbs)	450 kg (992 lbs)	945 kg (2083 lbs)

^{*} For other countries refer to your local AFTER-SALES HEAD OFFICE for details of the towing weights permitted.

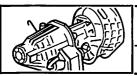
One single fitting kit available from the Parts Department enables vehicles with either the 400 mm or 480 mm radiator to be modified to suit.

TEMPERATURE

THE TRANSMISSION OIL TEMPERATURE MUST NOT EXCEED 140°C UNDER ANY CIRCUMSTANCES. IT IS ADVISABLE TO FIT AN OIL TEMPERATURE GAUGE PARTICULARLY IF TOWING IS CONTEMPLATED IN MOUNTAINOUS AREAS.

CAPACITY

The transmission oil capacity increases by approximately 0.2 litre (1/3 Imp. pt.).





R.1177- R.1337

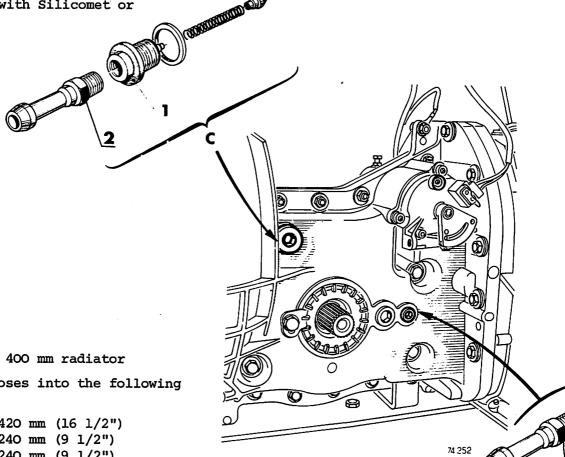
Disconnect battery.

Drain transmission case.

Remove the two plugs (arrowed). Screw assembly (C) into the top hole. Tightening torque of valve (1): 9 to

11 m. da N (67 to $82\frac{1}{2}$ lb/ft).

Smear the threads on the taper end fittings (2) with Silicomet or equivalent.



Vehicles with 400 mm radiator

Cut the oil hoses into the following lengths:

- hose (3) 420 mm (16 1/2")
- hose (4) 240 mm (9 1/2")
- hose (5) 240 mm (9 1/2")
- hose (6) 180 mm (7")
- hose (7) 160 mm (6 1/4")

Drill two 13 mm diameter holes in the front bottom crossmember and insert the 2 cage nuts.

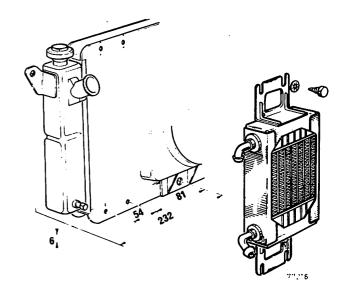
Vehicles with 480 mm radiator

Cut the oil hoses into the following lengths:

- hose (3) 360 mm (14 1/8")
- hose (4) 160 mm $(6 \ 1/4")$
- hose (5) 240 mm (9 1/2")
- hose (6) 180 mm (7")
- hose (7) 160 mm (6 1/4")

Drill two 6 mm diameter holes in each radiator flange (top and bottom) .

Insert "Rapid" nuts and fit the oil radiator.





R.1177- R.1337

Connect hose (3) to the top union on the oil radiator and hose (4) to the bottom union.

Connect the other ends of hoses (3) and (4) to metal pipes (8) and (9) respectively, then fix the latter:

- to the alternator bracket, using bracket
 (11) and its clamp,
- to the engine mounting, using bracket (12) and its clamp.

Connect metal pipe (8) to the top tapered end fitting by means of oil hose (5).

Fit the pads and bushes to bottom bracket (A) then fit the latter to the crossmember.

Insert a cage screw into the existing hole in the top crossmember.

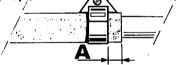
Fit the pad and bush to top bracket (B) and fix the latter to the crossmember. Fit the radiator.

Connect metal pipe (10):

- to metal pipe (9), by means of oil hose (6),
- to tapered end fitting (2), by means of oil hose (7).

Attach metal pipe (10) to the flanged edge of the lower sidemember using two clips (13).

Take care to fit oil hoses and metal pipes correctly and tighten the hose clips so that free length $A=6\,$ mm (1/4") approximately. Fit sections of "Snap-on" profile to the sidemembers and crossmembers in the areas where there is a risk of the hoses and pipes rubbing.



74257

OIL TEMPERATURE GAUGE

Parts required for the installation:

- 1 thermal switch	77 00 503 200
- 1 washer	77 03 062 001
- 1 gauge	77 01 018 273
- 1 sump with welded nut	77 00 610 743
- 1 gasket	77 01 460 396

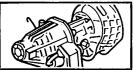
Remove sump (1).

Change the gasket and fit the new sump with the welded nut.

Screw the temperature gauge in position using the washer.

Make up the wiring and fit the temperature gauge where required on the dashboard.

Fill the automatic transmission and check the level.



Code 9536

Specification



RENAULT 16 (R.1153 - R.1154 - R.1155 - R.1156)

TOWING WEIGHTS (FRANCE) *

A caravan or trailer of the following towing weights may be towed after an oil cooler has been fitted to the automatic transmission hydraulic circuit:

Up to 1977 model:

R.1153 - R.1154

1050 Kg (2310 lbs)

R.1156 (automatic transmission): 1090 Kg (2403 lbs)

From 1977 onwards:

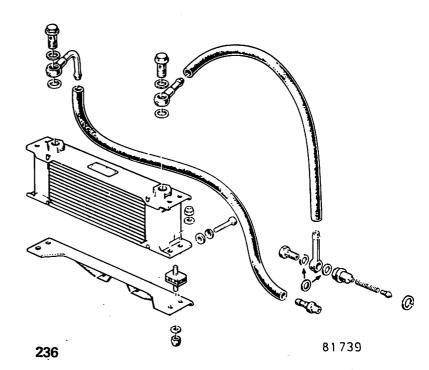
	Unbraked trailer		Braked trailer		
	without oil cooler	with oil cooler	without oil cooler	with oil cooler	
R.1153	450 Kg (992 lbs)	500 Kg (1102 lbs)	450 Kg (992 lbs)	1050 Kg (2310 lbs)	
R.1155 R.1156	450 Kg (992 lbs)	500 Kg (1102 lbs)	450 Kg (992 lbs)	1090 Kg (2403 lbs)	

^{*} For other countries: refer to your local AFTER-SALES HEAD OFFICE for details of the towing weights permitted.

CAPACITY

The transmission oil capacity increases by about 0,2 litre (1/3 Imp. pt.)

FIRST ASSEMBLY



: | |} |

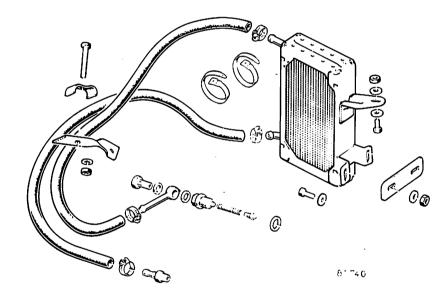




R.1153 - R.1154 - R.1155 - R.1156

SECOND ASSEMBLY

A new kit has been designed for fitting to vehicles which have air conditioning. The above kit will be supplied for vehicles without air conditioning when existing stocks of the first assembly kit have been exhausted.



The oil cooler is now located on the L.H. inner wing panel instead of being fixed on the automatic transmission.

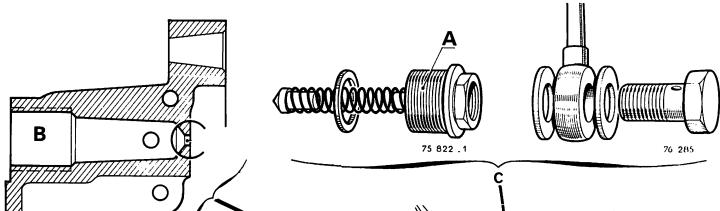




74 252

R.1153 - R.1154 - R.1155 - R.1156

HOW TO FIT THE 2ND. ASSEMBLY



Disconnect battery.

Drain transmission.

Remove:

75 824

- spare wheel
- 2 plugs (arrowed) on the transmission case.

Screw assembly (C) into the top hole, lining up the pipe horizontally. Tightening torque for valve body (A): 3,5 m. da N (26 lb/ft).

Screw union (1) into the bottom hole.

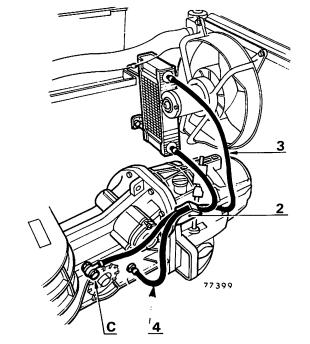
Fit the radiator to the L.H. inner wing panel level with the harness clips; counterdrill two 7 mm holes and insert cage nuts.

Remove one top fixing bolt from the mechanism casing and refit it with bracket (2) from the kit.

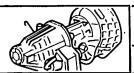
Connect:

- hose (3) between the top union on the radiator and assembly (C).
- return hose (4) between the bottom union on the radiator and union (1).

Fit the hoses to bracket (2).







OIL COOLER

Fitting instructions



R. 1153 - R. 1154 - R. 1155 - R. 1156

Take care to push the hoses well onto the unions.

Line up and tighten the hose clips. D = 6 mm (15/64") approximately.

On vehicles fitted with air conditioning, attach the hose to the compressor bracket using the plastic clips.

Check the transmission oil level and top up as required.

Circuit capacity after fitting oil radiator (Elf-Renaultmatic D2 or Mobil ATF 220 oil).

Transmission: 3 litres (5 1/4 Imp. pts.).

Cooling circuit: 0,2 litre (1/3 Imp. pt.) approx.

SPECIAL POINTS TO BE NOTED WHEN FITTING AN OIL COOLER

Type R.1153 and R.1154 vehicles fitted with automatic transmission lying within the following groups of fabrication numbers:

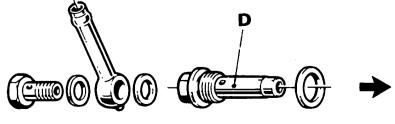
- -4139-00 No.1 to No.5917
- -4139-02 No.1 to No.0580
- -4139-10 No.1 to No.7349
- -4139-11 No.1 to No.1225

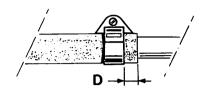
require the following parts to be ordered from the Parts Department in addition to the fitting kit when an oil cooler is fitted:

- 1 valve assembly Part No. 77 00 546 129
- 1 seal Part No. 07 03 326 900

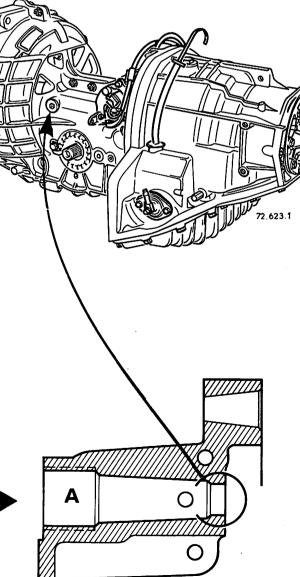
These vehicles are identifiable by the location for the converter jet which has no calibrated orifice (see drawing); in this case, fit valve assembly (D) instead of plug (A), spring and valve assembly (C).

The remaining operations follow in the same sequence as for the other vehicles (see page 3).





74257



75 823



Code 9536

Specification



RENAULT 15/17 (R. 1300 - R. 1302 - R. 1312 - R. 1318 - R. 1322 - R. 1328)

TOWING WEIGHTS (FRANCE) *

A caravan or trailer of the following total towing weight may be towed after an oil cooler has been fitted to the automatic transmission circuit:

	Unbraked		Braked	
	without oil cooler	with oil cooler	without oil cooler	with oil cooler
R.1300	•		450 kg (992 lbs)	750 kg*(1653 lbs)
R.1318	450 kg (992 lbs)	520 kg (1146 lbs)	450 kg (992 lbs)	850 kg (1874 lbs)
R.1328	450 kg (992 1bs)	540 kg (1191 lbs)	450 kg (992 lbs)	850 kg (1874 lbs)
R.1302 R.1312 R.1322	450 kg (992 lbs)	520 kg (1146 lbs)	450 kg (992 lbs)	750 kg*(1653 lbs)

^{* 850} kg (1874 lbs) from 1975 model onwards.

TEMPERATURE

THE TRANSMISSION OIL TEMPERATURE MUST NOT EXCEED 140 C UNDER ANY CIRCUMSTANCES. IT IS ADVISABLE TO FIT AN OIL TEMPERATURE GAUGE PARTICULARLY IF TOWING IS CONTEMPLATED IN MOUNTAINOUS AREAS.

CAPACITY

The transmission oil capacity is increased by approximately 0.2 litre (1/3 Imp.pt.).

^{**}For other countries: refer to your local AFTER-SALES HEAD OFFICE for details of the towing weights permitted.





R. 1302 - R. 1312 - R. 1318 - R. 1322 - R. 1328

FITTING INSTRUCTIONS

Disconnect battery.

Drain the automatic transmission.

Remove:

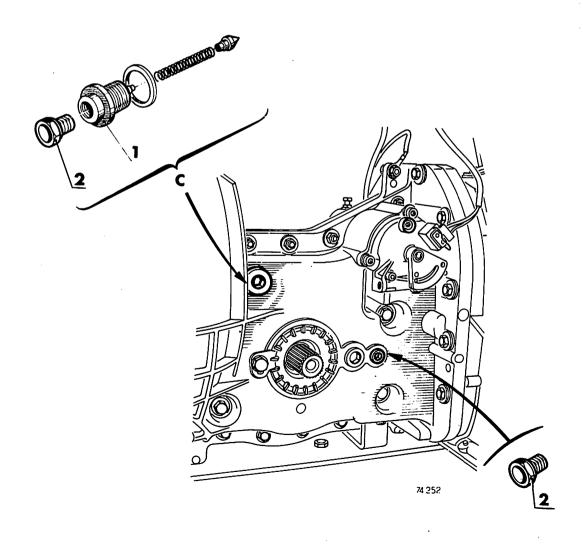
- the anti-roll bar
- tubular crossmember
- dephaser bracket
- and leading exhaust pipe.

Unscrew the 2 plugs (arrowed).

Screw in valve assembly (C) after smearing the threads with jointing paste.

Torque tightening of valve (1): 9 to 11 m. da N $(67\frac{1}{2}$ to $82\frac{1}{2}$ lb/ft)

Screw unions (2) into valve (1) and the lower hole in the casing.





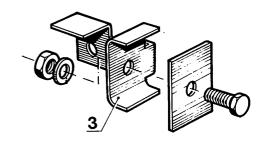


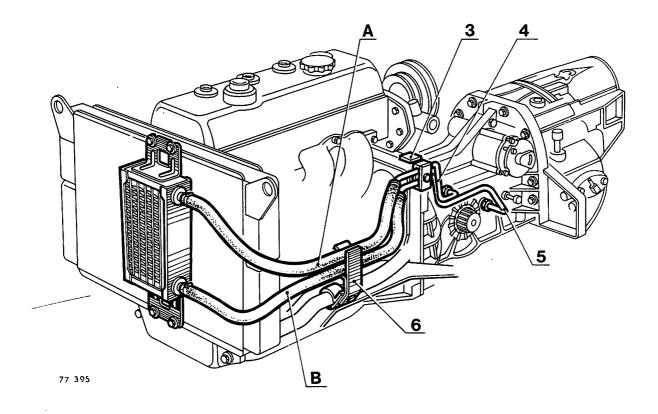
R. 1302 - R. 1312 - R. 1318 - R. 1322 - R. 1328

Unscrew the starter top fixing bolt.

Fit bracket (3) to it.

Screw metal pipe (4) to the top union in the transmission and metal pipe (5) to the bottom union. Secure both pipes to bracket (3) with the plate.





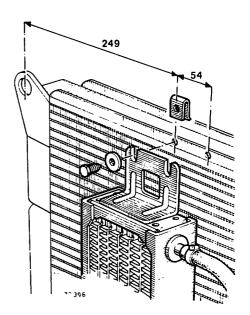
Remove the coolant radiator.

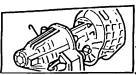
Drill 2 \times 6 mm dia. holes in the top and bottom flanges at the front.

Cut the oil hoses into the following lengths:

- hose (A) = 970 mm (38 3/8")
- hose (B) = 890 mm (35").

Connect hose (A) to the top union on the oil radiator and hose (B) to the bottom union.







R. 1302 - R. 1312 - R. 1318 - R. 1322 - R. 1328

Take care to fit the oil hoses and metal pipes correctly and tighten the hose clips.

Free length $A = 6 \text{ mm } (\frac{1}{4})$ approximately.

Offer up the coolant radiator-oil cooler assembly.

Remove the hose clip from the inner wing panel.

Refit it so that it pairs oil hoses retaining clip (6).

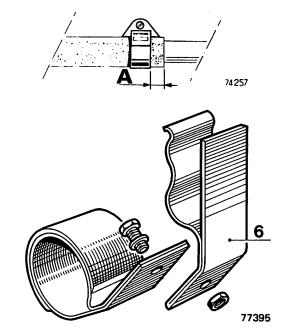
Connect hose (A) to metal pipe (4) and hose (B) to metal pipe (5).

Slip the hoses into the clip.

Refit:

- the leading exhaust pipe
- dephaser bracket
- tubular crossmember
- and anti-roll bar.

Bleed the cooling circuit.



FITTING AN OIL TEMPERATURE GAUGE

The transmission oil temperature must never exceed 140°C.

An oil temperature gauge may be fitted at Customer request.

Parts required for fitting:

- :	l temperature switch	77	00	503	200
- :	l gasket	77	03	062	001
-	l temperature gauge	77	01	018	273
- :	l cover with welded nut	77	00	610	743
- :	l sea	77	01	460	396

Remove the bottom cover.

Change the gasket and fit the cover with the welded nut.

Screw in the temperature switch. Make up the necessary wiring and fit the temperature gauge in the desired position on the dashboard.

Top up the transmission with recommended oil and check the level.

CAPACITY AFTER FITTING OIL COOLER

(Elf-Renaultmatic D2 or Mobil ATF 220 oil)

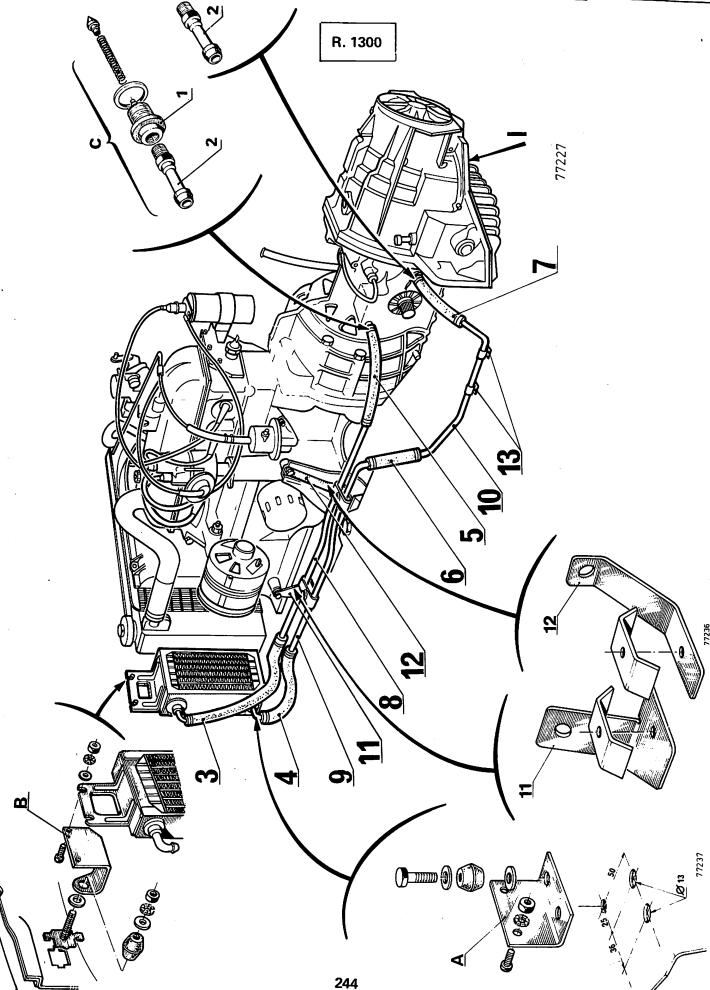
The transmission oil capacity increases by approximately 0,2 litre (1/3 Impt. pt.) when an oil cooler is fitted.



OIL COOLER

Fitting instructions

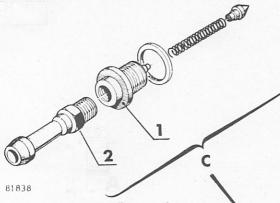








R. 1300



Vehicles with 400 mm radiator

Cut the oil hoses into the following lengths:

- hose (3) 420 mm (16 1/2")
- hose (4) 240 mm (9 1/2")
- hose (5) 240 mm (9 1/2")
- hose (6) 180 mm (7")
- hose (7) 160 mm (6 1/4")

Drill two 13 mm diameter holes in the front bottom crossmember and insert the 2 cage nuts.

Vehicles with 480 mm radiator

Cut the oil hoses into the following lengths:

- hose (3) 360 mm (14 1/8")
- hose (4) 160 mm $(6 \ 1/4")$
- hose (5) 240 mm (9 1/2")
- hose (6) 180 mm (7")
- hose (7) 160 mm (6 1/4")

Drill two 6 mm diameter holes in each radiator flange (top and bottom) .

Insert "Rapid" nuts and fit the oil radiator.

All types

Connect hose (3) to the top union on the oil radiator and hose (4) to the bottom union.

Connect the other ends of hoses (3) and (4) to metal pipes (8) and (9) respectively, then fix the latter:

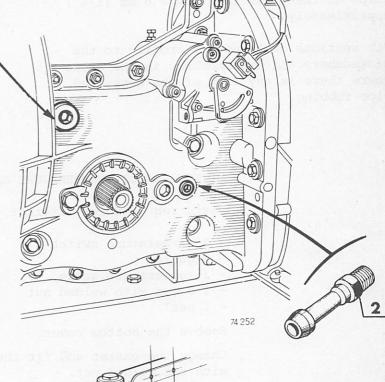
- to the alternator bracket, using bracket (11) and its clamp.
- to the engine mounting, using bracket (12) and its clamp.

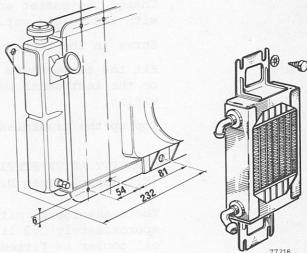
Connect metal pipe (8) to the top tapered end fitting by means of oil hose (5).

Fit the pads and bushes to bottom bracket (A) then fit the latter to the crossmember.

Insert a cage screw into the existing hole in the top crossmember.

Disconnect battery. Drain transmission case. Remove the two plugs (arrowed). Screw assembly (C) into the top hole. Tightening torque of valve (1): 9 to 11 m. da N (67 to $82\frac{1}{2}$ lb/ft). Smear the threads on the taper end fittings (2) with Silicomet or equivalent.





Fit the pad and bush to top bracket (B) and fix the latter to the crossmember. Fit the radiator.

Connect metal pipe (10):

- to metal pipe (9), by means of oil hose (6).
- to tapered end fitting (2), by means of oil hose (7).

Attach metal pipe (10) to the flanged edge of the lower sidemember using two 245 clips (13).

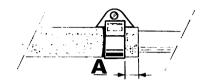




R. 1300

Take care to fit oil hoses and metal pipes correctly and tighten the hose clips so that free length A = 6 mm (1/4") approximately.

Fit sections of "Snap-on" profile to the sidemembers and crossmembers in the areas where there is any risk of the hoses and pipe rubbing.



74257

FITTING AN OIL TEMPERATURE GAUGE

Parts required for fitting:

 l temperature switch 	77 00 503 200
- l gasket	77 03 062 001
- 1 temperature gauge	77 01 018 273
 l cover with welded nut 	77 00 610 743
- 1 seal	77 01 460 396

Remove the bottom cover.

Change the gasket and fit the new bottom cover with the welded nut.

Screw in the temperature switch.

Fit the temperature gauge in the desired position on the instrument panel and make up the necessary wiring.

Top up the transmission and check its oil level.

CAPACITY AFTER FITTING OIL COOLER (Elf-Renaultmatic D2 or Mobil ATF 220 oil).

The transmission oil capacity increases by approximately 0,2 litre (1/3 Imp. pt.) when an oil cooler is fitted.



Code 9536

Specification



RENAULT 18 (R. 1341 - R. 1351)

TOWING WEIGHTS (FRANCE) *

A caravan or trailer of the following towing weight may be towed after an oil cooler has been fitted to the automatic transmission hydraulic circuit:

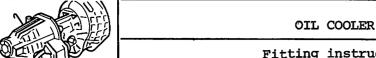
Unbraked		Braked		
w 	ithout oil cooler	with oil cooler	without oil cooler	with oil cooler
R.1340	450 kg (992 lbs)	460 kg (1014 lbs)	450 kg (992 lbs)	1000 kg (2205 lbs)
R.1341	450 kg (992 lbs)	480 kg (1058 lbs)	450 kg (992 lbs)	1000 kg (2205 lbs)
R.1351	450 kg (992 lbs)	510 kg (1124 lbs)	450 kg (992 lbs)	1000 kg (2205 lbs)

^{*} For other countries: refer to your local AFTER-SALES HEAD OFFICE for details of the towing weights permitted.

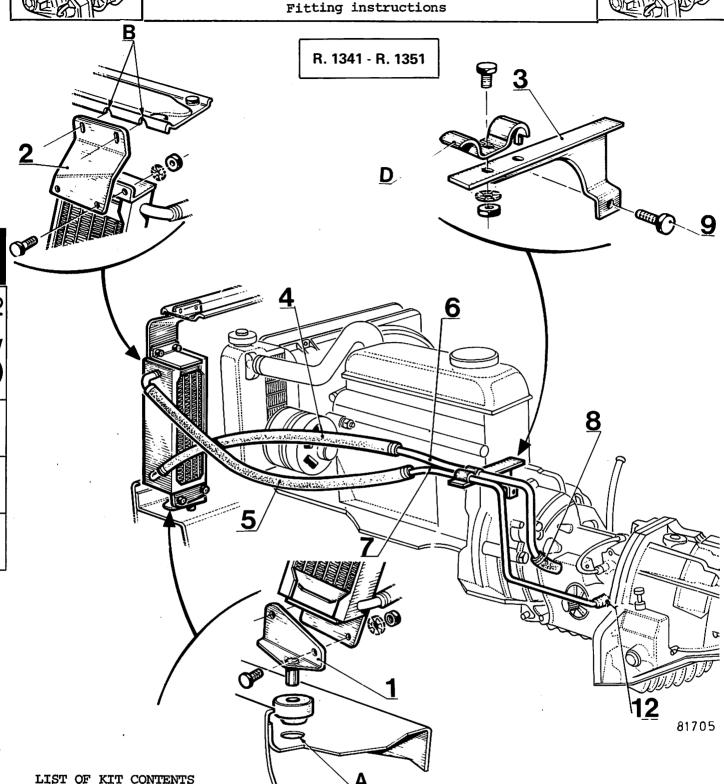
One single fitting kit available from the Parts Department enables vehicles with either the 480 mm or 540 mm radiator or with air conditioning to be modified to suit.

CAPACITY

The transmission oil capacity is increased by approximately 0.2 litre (1/3 Imp. pt.).







- 1 Cooler bottom bracket
- 2 Cooler top bracket
- 3 Hose support
- 4 Oil return hose
- 5 Oil feed hose
- 6 Oil return pipe
- 7 Oil feed pipe
- 8 Oil return hose
- 9 Starter top mounting bolt

- 10 Check valve
- 11 Taper end fittings
- 12 Oil feed hose
 - A Hole in bottom crossmember
- B Holes in top crossmember
- C Assembly containing plug, check valve spring, seal and check valve
- D Hose bracket.



- Disconnect battery.
- Drain automatic transmission.

Fitting the oil cooler

Attach bottom bracket (1) and top bracket (2) to the oil cooler.

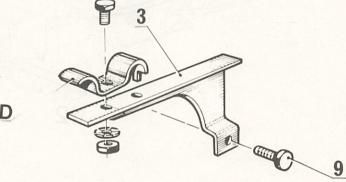
Insert rubber ring in hole (A) in the bottom crossmember.

Attach the top bracket to the front end panel crossmember holes (B).

Fitting the hose bracket

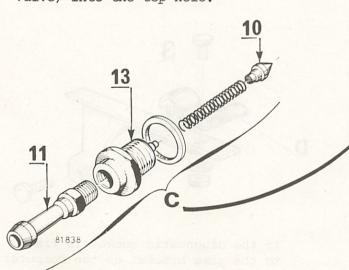
Remove the starter top mounting bolt (9). Fit hose bracket (3).

Refit starter mounting bolt.

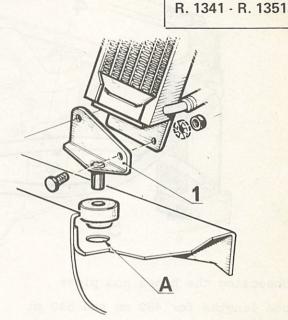


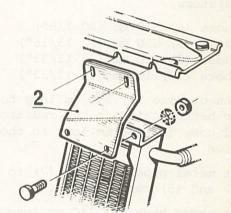
Fitting the tapered end fittings to the automatic transmission.

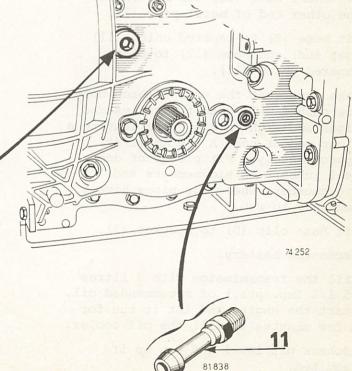
- Remove the 2 plugs (arrowed).
- Screw assembly (C) (plug, check valve spring, seal and check valve) into the top hole.



- Torque tighten oil cooler union (13) to between 3,2 and 3,7 m. da N (24 to 28 lb/ft).
- Smear the threads on tapered unions (11) with Silicomet compound or equivalent.









OIL COOLER

Fitting instructions

6



R. 1341 - R. 1351



Connecting the hoses and pipes

Hose lengths for $480~\mathrm{mm}$ and $540~\mathrm{mm}$ radiators.

- hose (4) 530 mm (20 7/8")
- hose (5) 630 mm (24 13/16")
- hose (8) 110 mm (4 11/32")
- hose (12)110 mm (4 11/32")

Connect hose (4) 530 mm long to the bottom union on the radiator and hose (5) 630 mm long to the top union.

Fit metal pipes (6) and (7) to hoses (4) and (5) respectively.

Fit short hose (8) 110 mm long to the other end of metal pipe (6).

Fir short hose (12) 110 mm long to the other end of metal pipe (7).

Fit hose (8) to tapered union (11) (jet end) and hose (12) to plain tapered union (11).

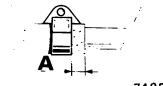
Make sure that the ends of each hose are pushed well onto the unions and pipes and tighten the clips leaving a clear end of hose A = 6 mm (1/4") approximately. Fit pieces of door seal rubbers on sidemembers and crossmembers where the pipes have a tendency to rub.

Fit hose clip (D) to bracket (3).

Reconnect battery.

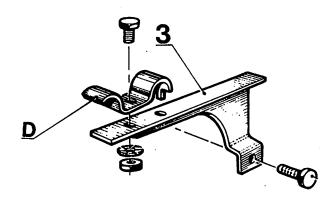
Fill the transmission with 3 litres (5 1/2 Imp. pts.) of recommended oil, start the engine and let it run for a few minutes to fill the oil cooler.

Recheck oil level and top up if required.



74257

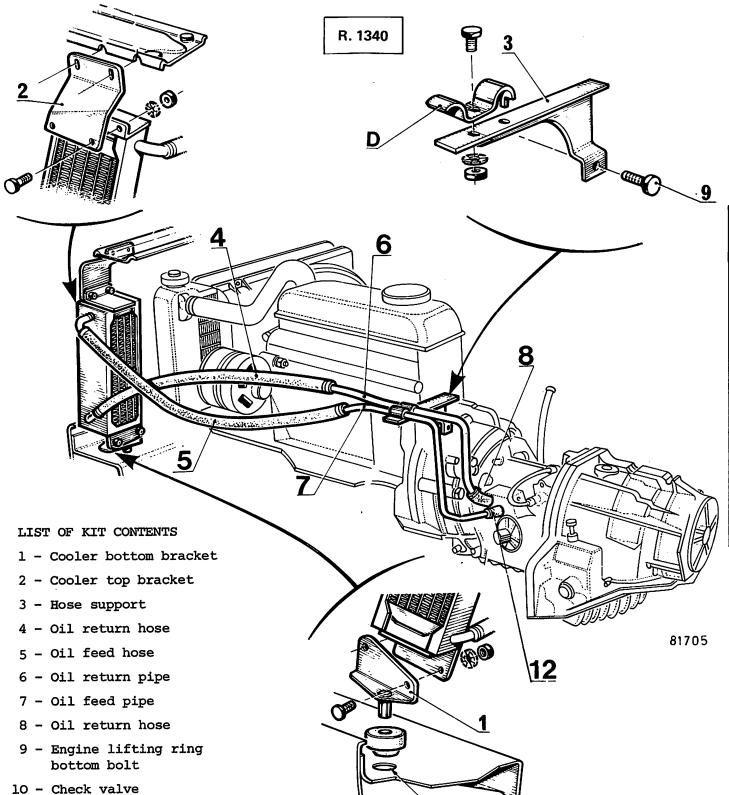
81705



If the diagnostic socket is fixed to the same bracket as the computer harness:

Fit a bracket Part No.7700 660 881 to the cylinder head and attach the diagnostic socket to it so that the diagnostic plug may be inserted when the oil cooler pipes are in position.





- io check varve
- 11 Taper end fittings
- 12 Oil feed hose
- 13 Oil cooler jet
- 14 Bracket (to be made locally)
- 15 Bolt 08 x 20mm long (not supplied)

- A Hole in bottom crossmember
- B Holes in top crossmember
- C Assembly containing plug, check valve spring, seal and check valve
- D Hose bracket.





- Disconnect battery.
- Drain automatic transmission.

Fitting the oil cooler

Attach bottom bracket (1) and top bracket (2) to the oil cooler.

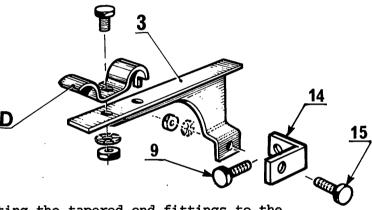
Insert rubber ring in hole (A) in the bottom crossmember.

Attach the top bracket to the front end panel crossmember holes (B).

Fitting the hose bracket

Make up a bracket as shown.

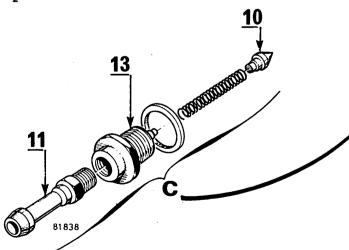
Remove the engine lifting ring bottom bolt (9). Fit hose bracket (3) with bracket (14) attached. Refit the engine lifting ring bottom bolt.



Fitting the tapered end fittings to the automatic transmission.

- Remove the 2 plugs (arrowed).

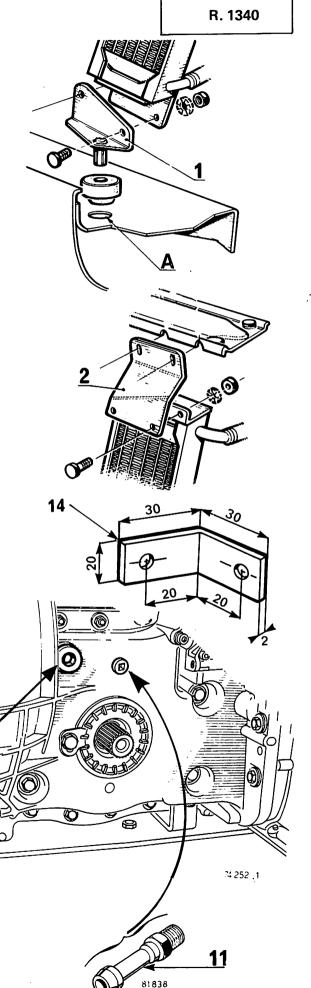
 Screw assembly (C) (plug, check valve spring, seal and check valve) into the top hole.



- Torque tighten oil cooler union (13) to between 3,2 and 3,7 m. da N (24 to 28 lb/ft).

- Smear the threads on tapered unions (11) with Silicomet compound or equivalent.

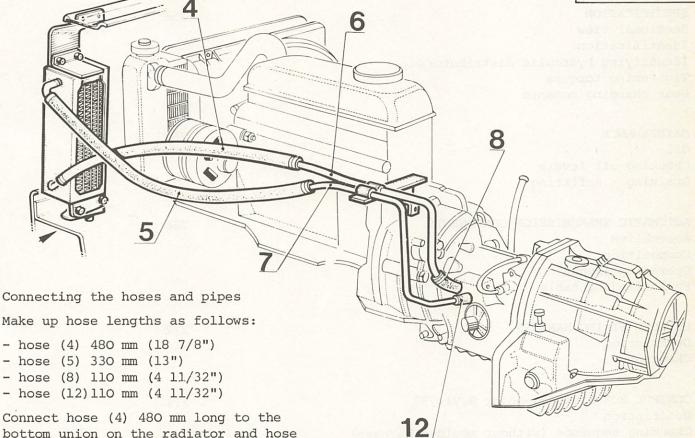
252



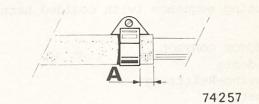


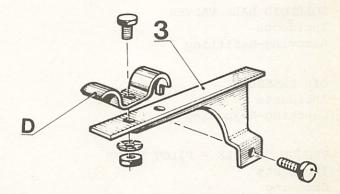


R. 1340



81705.1





bottom union on the radiator and hose (5) 330 mm long to the top union.

Fit metal pipes (6) and (7) to hoses (4) and (5) respectively. Bend them slightly to clear the alternator.

Fit short hose (8) 110 mm long to the other end of metal pipe (6).

Fit short hose (12) 110 mm long to the other end of metal pipe (7).

Fit hose (8) to tapered union (11) (jet end) and hose (12) to plain tapered union (11).

Make sure that the ends of each hose are pushed well onto the unions and pipes and tighten the clips leaving a clear end of hose A = 6 mm (1/4")approximately.

Fit pieces of door seal rubbers on sidemembers and crossmembers where the pipes have a tendency to rub.

Fit hose clip (D) to bracket (3).

Reconnect battery.

Fill the transmission with 3 litres (5 1/2 Imp. pts.) of recommended oil, start the engine and let it run for a few minutes to fill the oil cooler.

AUTOMATIC TRANSMISSION

TYPE 4141

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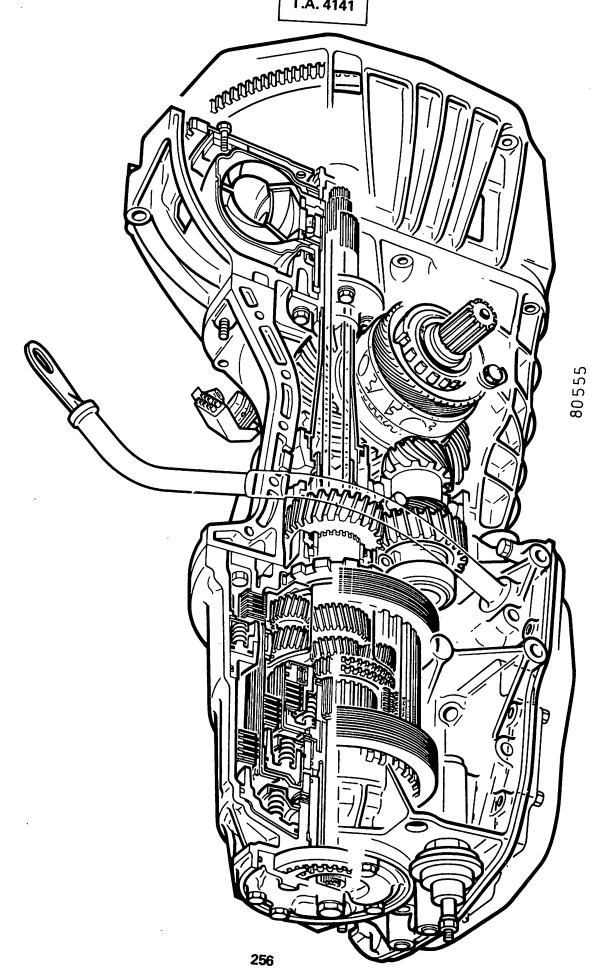
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SPECIFICATION

Sectional view



T.A. 4141



The transmission shown here is the 4141-00





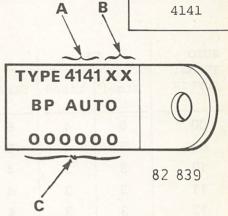
Identification

The identification plate is stamped with the following data;

- At A : automatic transmission type

- At B ; type suffix

- At C : fabrication No.



Auto trans, suffix	Vehicle	Final drive	Step-down cluster	Speedo drive	Special points
00	R.1273	9X35	26X25	26X21	8 05
01	R.1273	9X35	26X25	26X21	Extreme cold
10	R.1271	8X33	27X25	26X23	1 8 35
11	R.1271	8X33	27X25	26X23	Extreme cold
12	R.1271	8X33 or 9X37	26X25	26X23	a lyses tell-
13	R.1271	8X33 or 9X37	26X25	26X23	Extreme cold
17	R.1271	9X37	26X25	26X23	F Wees (19
18	R.1271	9X37	26X25	26X23	Extreme cold
20	R.1272	8X33 or 9X37	27X25	26X22	3 3
21	R.1272	8X33 or 9X37	27X25	26X22	Extreme cold
25	R.1272	8X33 or 9X37	27X25	26X22	42 3
26	R.1272	8X33 or 9X37	27X25	26X22	Extreme cold
30	R.1273	9X35	26X25	26X21	82 3
30	R.1275	9X35	26X25	26X21	5 00
31	R.1275	9X35	26X25	26X21	Extreme cold
41	R.1278	9X35	26X25	26X21	
42	R.1278	9X35	26X25	26X21	Extreme cold
50	R.1272	9X37	27X25	26X22	Divides A
51	R.1272	9X37	27X25	26X22	Extreme cold
52	R.1272	9X37	27X25	26X22	Cross-country
60	R.1275	9X35	26X25	26X21	
61	R.1275	9X35	26X25	26X21	Extreme cold
62	R.1275	9X35	26X25	26X21	Extreme cold

Identification



4141

										
AUTO	F	:1	F	2	E	1	E	2	F1	F2
TRANS. SUFFIX	Steel	Lined	Steel	Lined	Steel	Lined	Steel	Lined	Non-adjust.	Adjustable
00	5	4	5	4	5	4	5	4	1. to 3,20	1,5 to 2
01	5	4	5	4	5	4	5	4	1 to 3,20	1,5 to 2
10	3	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
11	3	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
12	3	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
13	3	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
17	3	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
18	3	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
20	3	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
21	3	3	-4	3	4	3	4	3	1,05-2,85	1 to 1,5
24	3	3	4	3	. 4	3	4	3	1,05-2,85	1 to 1,5
25	3	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
26	3	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
28	3	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
30 (lst.assy)	4	4	4	3	5	4	5	4	1,05-2,85	1 to 1,5
30 (2nd.assy)	3	3	4	3	5	4	5	4	1,05-2,85	1 to 1,5
31 (1st.assy)	1	4	4	3	5	4	5	4	1,05-2,85	1 to 1,5
31 (2nd.assy)		3	4	3	5	4	5	4	1,05-2,85	1 to 1,5
37	3	3	4	3	5	4	5	4	1,05-2,85	1 to 1,5
38	3	3	4	3	5	4,	5	4	1,05-2,85	1 to 1,5
40	3	3	4	3	5	4	5	3	1,05-2,85	1 to 1,5
41	3	3	4	3	5	4	5	4	1,05-2,85	1 to 1,5
42	3	3	4	3	5	4	5	4	1,05-2,85	1 to 1,5
50	3	3	4	3	4	3	4	3	1 '	1 to 1,5
51	3	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
52	3 .	3	4	3	4	3	4	3	1,05-2,85	1 to 1,5
60	3	3	4	3	5	4	5	4		1 to 1,5
61	3	3	4	3	5	4	5	4	1,05-2,85 1,05-2,85	1 to 1,5
62	3	3	4	3	5	4	5	4	1 '	1 to 1,5
1 02 1	· •			, ,	, ,		, ,	. ~	1,05-2,85	. T (C) T'2

*A = disc with 8 x 0,4 mm wave forms

B = disc with 8 x 1,2 mm wave forms

C = disc with 7 x 1,2 mm wave forms



Identification



4141

E1	E2	Fl THRUST	F2	TYPE OF	El	E2 SPACER
Non addust	Adjust-	PLATE E in mm	PISTON B in mm	F2* WAVE FORM DISC	PISTON C in mm	PLATE D in mm
Non-adjust.	able	E III IIIII	B 111 11111		<u> </u>	
1,05 to 3,75	1 to 2	6,3	21,3	Α	14,4	43,3
1,05 to 3,75	1 to 2	6,3	21,3	Α	14,4	43,3
0,9 to 3,3	0,8 to 2	13,2	26,5	В	19,4	48,2
0,9 to 3,3	0,8 to 2	13,2	26,5	В	19,4	48,2
0,9 to 3,3	0,8 to 2	13,2 8,5	26,5	В	19,4	48,2
0,9 to 3,3	0,8 to 2	13,2 8,5	26,5	В	19,4	48,2
0,9 to 3,3	0,8 to 2	8,5	26,5	С	19,4	48,2
0,9 to 3,3	0,8 to 2	8,5	26,5	С	19,4	48,2
0,9 to 3,3	0,8 to 2	13,2 8,5	26,5	В.	19,4	48,2
0,9 to 3,3	0,8 to 2	13,2 8,5	26,5	В	19,4	48,2
0,9 to 3,3	0,8 to 2	8,5	26,5	С	19,4	48,2
0,9 to 3,3	0,8 to 2	8,5	26,5	В	19,4	48,2
0,9 to 3,3	0,8 to 2	8,5	26,5	В	19,4	48,2
0,9 to 3,3	0,8 to 2	8,5	26,5	С	19,4	48,2
1,05 to 3,75	1 to 2	8,5	26,5	В	14,4	43,3
1,05 to 3,75	1 to 2	13,2 8,5	26,5	В	14,4	43,3
1,05 to 3,75	1 to 2	8,5	26,5	В	14,4	43,3
1,05 to 3,75	1 to 2	13,2 8,5	26,5	В .	14,4	43,3
1,05 to 3,75	1 to 2	8,5	26,5	С	14,4	43,3
1,05 to 3,75	1 to 2	8,5	26,5	С	14,4	43,3
1,05 to 3,75	1 to 2	8,5	26,5	С	14,4	43,3
1,05 to 3,75	1 to 2	8,5	26,5	С	14,4	43,3
1,05 to 3,75	1 to 2	8,5	26,5	С	14,4	43,3
0,9 to 3,3	0,8 to 2	8,5	26,5	С	19,4	48,2
0,9 to 3,3	0,8 to 2	8,5	26,5	С	19,4	48,2
0,9 to 3,3	0,8 to 2	8,5	26,5	С	19,4	48,2
1,05 to 3,75	1 to 2	8,5	26,5	С	14,4	43,3
1,05 to 3,75	1 to 2	8,5	26,5	С	14,4	43,3
1,05 to 3,75	1 to 2	8,5	26,5	С	14,4	43,3
		PROVISIONAL ASSEMBLY FINAL ASSEMBLY	B .		o; [] =	D
	ı l	N°10	79601	83587	79602	80567

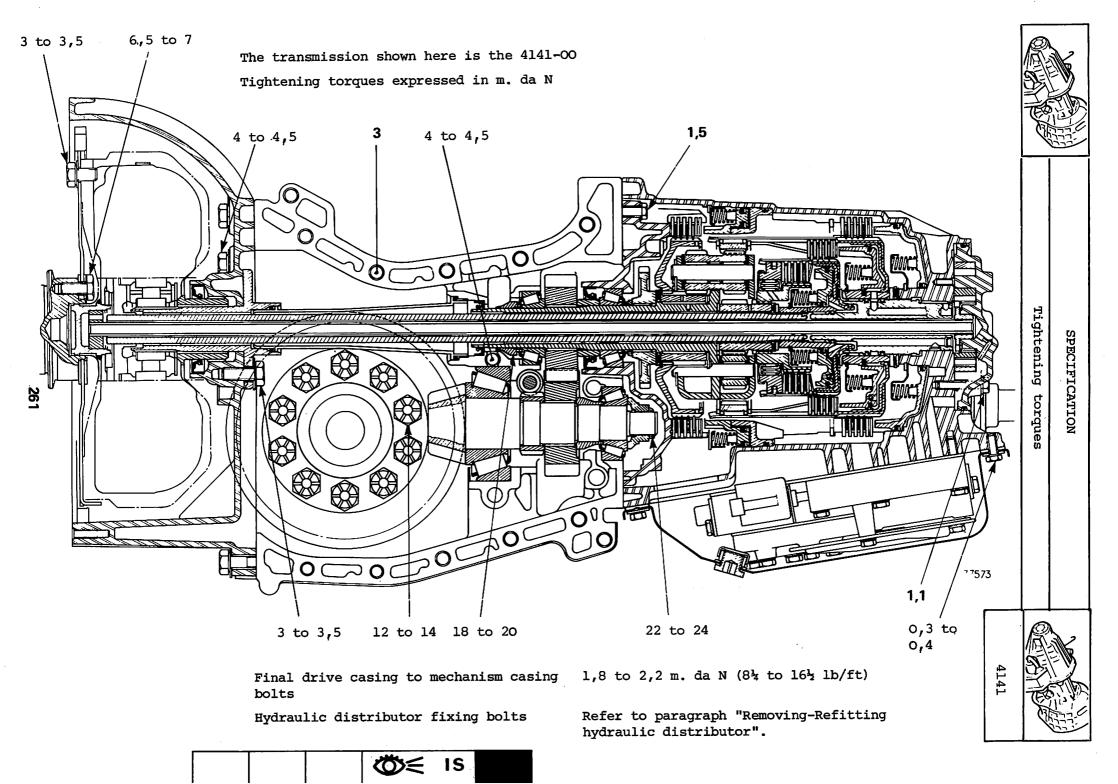


Identifying hydraulic distributors



4141

DISTRIBUTOR SUFFIX	TRANSMISSION SUFFIX	SPECIAL FEATURES
10	00-01	NON-INTERCHANGEABLE
11	10-11-30-31	
20	10-11-12-13-30-31	
21	20-21	Small hole - large hole
207	10-11-12-13-30-31	3
217	20-21	Improved 2 change
24	41-42	For R. 1278
22	10-11-12-13-17-18 30-31-37-38-40-41 42-60-61-62	
23	20-21-24-25-26-28 50-51-52	



Gear changing moments



4141

R. 1271 - R. 1273 - R. 1275 - R. 1278

Foot	Gear ch	Gear changing moments (in km/h)				
position	1 ~ 2	2 1	2 / 3	3 _ 2		
Light throttle (PL)		12 (7월)		22 (13½)		
Full throttle (PF)	60 (37)		103 (64)			
Kick-down (RC)	62 (38½)		107 (66½)			

(Miles per hour in brackets)

R. 1272

	Gear changing moments (in km/h)					
Foot position	1 2	2 1	2 3	3 2		
Light throttle (PL)		12 (7½)		23 (144)		
Full throttle (PF)	63 (39)		108 (67)			
Kick-down (RC)	66 (41)		113 (70)			

(Miles per hour in brackets)

Gear changing moments

The figures shown in the above tables give the average theoretical moments for gear changing (stopwatch timed speeds).

They may vary depending on the tolerances in the units (governor, computer, speedometer) also on the type of tyre fitted.

Oil



4141

RECOMMENDED OILS

The oils used in the final drive casing and mechanism casing are of different grades.

FINAL DRIVE

API GL 5 or MIL 2105 B or C

- . SAE 80 W (for hot and temperate countries)
- . SAE 75 W (for cold countries)

MECHANISM CASING AND CONVERTER

ELF RENAULTMATIC D2

or

MOBIL ATF 220

CAPACITIES

Final drive: 1,6 litres (3 Imp. pts.)

Mechanism casing and converter:

TOTAL

After draining

R.1271

5,5 litres $(9\frac{1}{2}$ Imp. pts.)

R.1272-R.1273 R.1275-R.1278 6 litres (10½ Imp. pts.)

2,5 litres (4½ Imp. pts.) then check level.

After fitting a new, Standard Service Exchange or overhauled automatic transmission, pour in 3,5 litres (6 Imp. pts.) because some oil will still be in the converter. (Check the level and top up as necessary).

MAINTENANCE

Checking oil levels



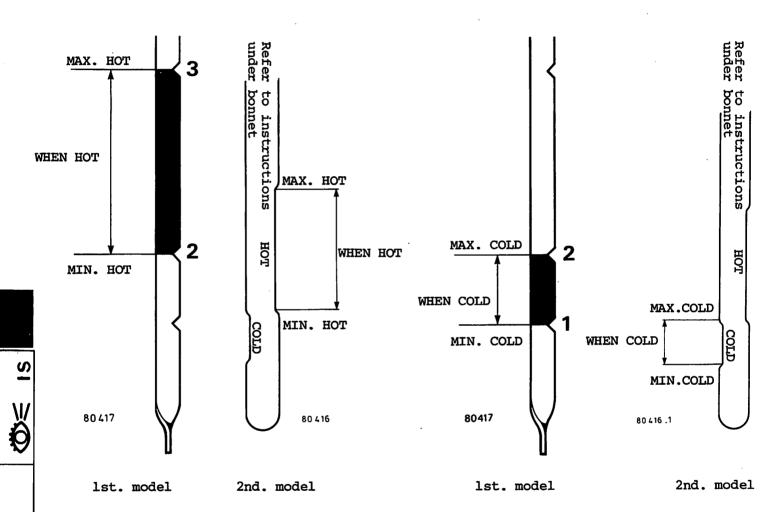
4141

- Place vehicle on smooth level ground.

- Select "P" (PARK)
- Start engine and wait a minute or two for the converter and oil cooler (if fitted) to fill.

CHECKING WHEN TRANSMISSION IS HOT (after a drive of approximately half an hour).

CHECKING WHEN TRANSMISSION IS COLD (immediately on starting engine or during an oil change).



- The oil temperature must be 80°C
- The oil level must never be below notch (2) nor above (3) MAX. HOT.
- The oil is at ambient temperature.
- The oil level must never be below notch (1) MIN. COLD (risk of damage) nor above notch (2) MAX. COLD.

NEVER OVERFILL BEYOND THE "MAX COLD" and "MAX HOT" LEVELS.

Warning:

An excess amount of oil may lead to:

- abnormal overheating of the oil,
- a tendency to leak.

Code 0157

Draining - Refilling



T.A. 4141

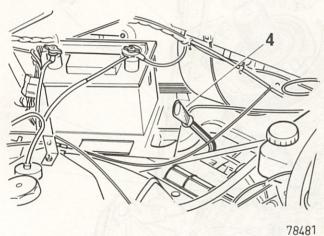
DRAINING

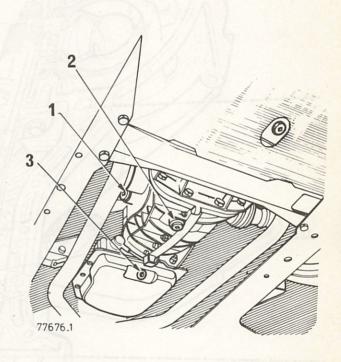
The oil must be drained while hot immediately after the engine has stopped as this gets rid of all the impurities held in suspension.

Proceed as follows:

- Mechanism casing and converter
 - . Remove dipstick (4),
 - . Unscrew drain plug (3),
 - . Allow it to drain as long as possible,
 - . Refit drain plug (3).

- Final drive
 - . Remove g (1) then drain plug (2),
 - . When drained, refit drain plug (2).





Oil changing frequency:

During the 1st Inspection and Checks between 1000 and 2000 km (500 and 1000 miles) then once every 30 000 km (20 000 miles).

REFILLING

Mechanism casing and converter:

Refill via the dipstick tube.

Use a funnel with a built in 15/100 mesh gauze filter to trap any foreign matter in the oil.

Pour in 2,5 litres (4½ Imp.pts.) of ELF RENAULTMATIC D2 or MOBIL ATF 220.

Start engine, check level and top up if required.

Assembly

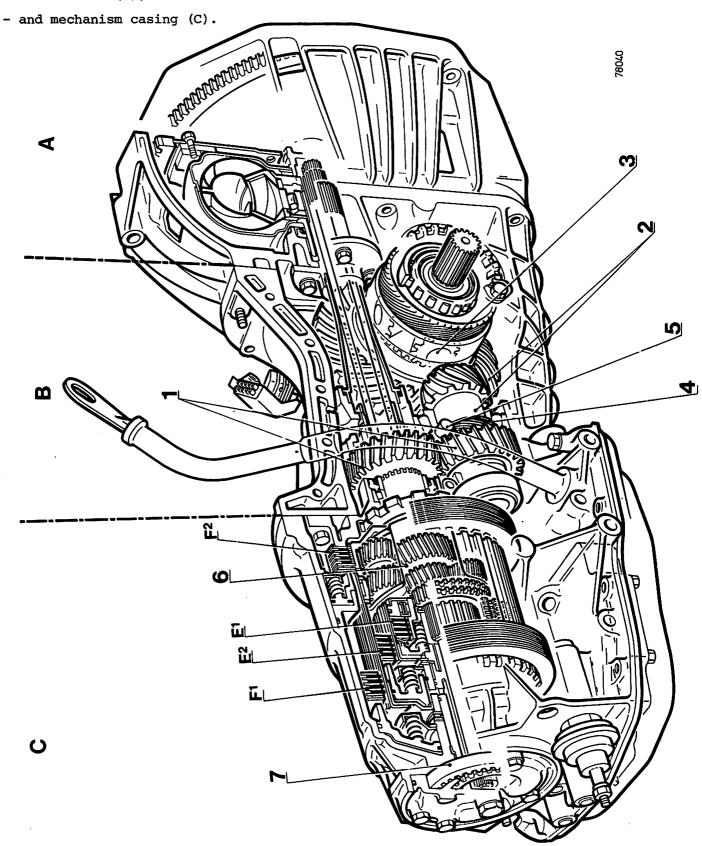


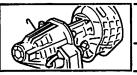
T.A. 4141

The automatic transmission enables the 3 forward speeds to be engaged one after the other with continuous torque action.

It comprises three main components:

- converter (A),
- final drive (B),





AUTOMATIC TRANSMISSION COMPONENTS

Composition



T.A. 4141

CONVERTER (A)

It provides:

- a smooth coupling for transmitting engine torque to the mechanical assembly,
- automatic clutch action,
- and increased torque for moving off.

FINAL DRIVE (B)

It transmits the drive from the mechanical assembly to the roadwheels.

It consists of:

- step-down gear cluster (1) which lowers the drive centreline,
- crown wheel and pinion (2) driving differential housing (3),
- and wheel (4) which drives governor worm (5).

MECHANICAL COMPONENTS CASING (C)

It gives 3 reduction ratios for forward movement and 1 reverse.

It comprises:

- an epicyclic gear train (6),
- 3 different control elements for the above train:
 - . mechanical,
 - . hydraulic,
 - . and electric.

The epicyclic gear train (6):

This is an assembly of helical gears which enable different ratios to be obtained (3 forward, 1 reverse) depending on hydraulic feed to the receivers (El - E2 - F1 - F2).

This train consists of:

- 2 sunwheels Pl and P2,
- 3 pairs of planet wheels S1 and S2 connected by a planet wheel carrier,
- and an involute ring gear.

The control elements

Mechanical components:

A freewheel which transmits torque in the engine-roadwheels direction only, no engine braking effect being available.

Multi-disc oilbath type El and E2 clutches and Fl and F2 brakes. These are hydraulic receivers which lock or release certain components in the eipcyclic gear train depending on the pressure of the hydraulic feed (from the hydraulic distributor), thus providing the different ratios.

Hydraulic components

Oil pump (7):

The involute gear oil pump is driven directly by the engine and supplies all the necessary pressure for the following services:

- converter operation,
- gear lubrication,
- and brakes and clutches.

It is located in the rear of the mechanical components casing.

Hydraulic distributor

This ensures:

- oil pressure regulation to suit engine load (vacuum capsule and pilot valve).
- pressurized oil feed or release to the clutches and brakes. Ratio changes are determined by the operation of two solenoid ball valves ELl and EL2. They receive their instructions from the governor-computer in the form of electrical impulses.

Vacuum capsule and pilot valve

The vacuum capsule and pilot valve ensure a pressure (pilot pressure) depending on engine load which determines the feed pressures to the receivers and, as a result, controls gear changing.

Composition



4141

Electrical components

They comprise:

A unit consisting of the governor and computer together.

The governor is a low output alternator (about 1 watt) driven by a worm on the final drive pinion. It produces current which varies according to:

- vehicle speed;
- engine load (position of accelerator pedal).

The computer receives the following information:

- alternating current from the governor;
- selector lever position.

Depending on the nature of the above information, the computer may or may not transmit instructions to the solenoid ball valves.

It also ensures that 1st. gear "Hold" may be selected safely (it prevents this ratio being engaged at a speed of more than 35 km/h (22 m.p.h.) on light throttle (PL).

The multiple switch

The cam opens or closes various electrical circuits depending on the position of the selector lever:

- Starter circuit

Current is supplied to the starter only when the selector lever is in position N or P.

- Reversing lights circuit (position R).
- ELl and EL2 solenoid ball valve circuits.

Kick-down switch

By being placed at the end of accelerator travel, it earths one of the computer circuits which in certain pre-determined conditions, will cause an immediate change down to a lower ratio.

Solenoid ball valves

These are solenoid operated ball valves which open or close hydraulic channels to change gear.

COMPONENTS ACTIVATED DEPENDING ON SELECTOR LEVER POSITION

tor r	El Clutch	IEZ CINTON	F2 F1	RL Free-	Solenoid ball valves		
ion			Brake	Brake	wheel	EL1	EL2
•						X	X
₹	Х			Х		Х	X
٧						X	X
1			X		X	Х	X
2		X	X				X
3	X	X					
1			Х		X	Х	X
2		Х	X				X
1	X		X			* X	X
	1 2 3 1	El Clutch X X 1 2 3 X 1 2	El Clutch E2 Clutch ion X X X X X X X X X X X X X X X X X X X	El Clutch E2 Clutch F2 Brake X X X X X X X X X X X X X	El Clutch E2 Clutch F2 Brake Brake X X X X X X X X X X X X X	El Clutch E2 Clutch F2 Brake Freewheel X X X X X X X X X X X X X X X X X X X	El Clutch E2 Clutch F2 F1 Free- Wheel EL1 X

^{*} below 35 km/h (22 m.p.h.) on light throttle (PL).

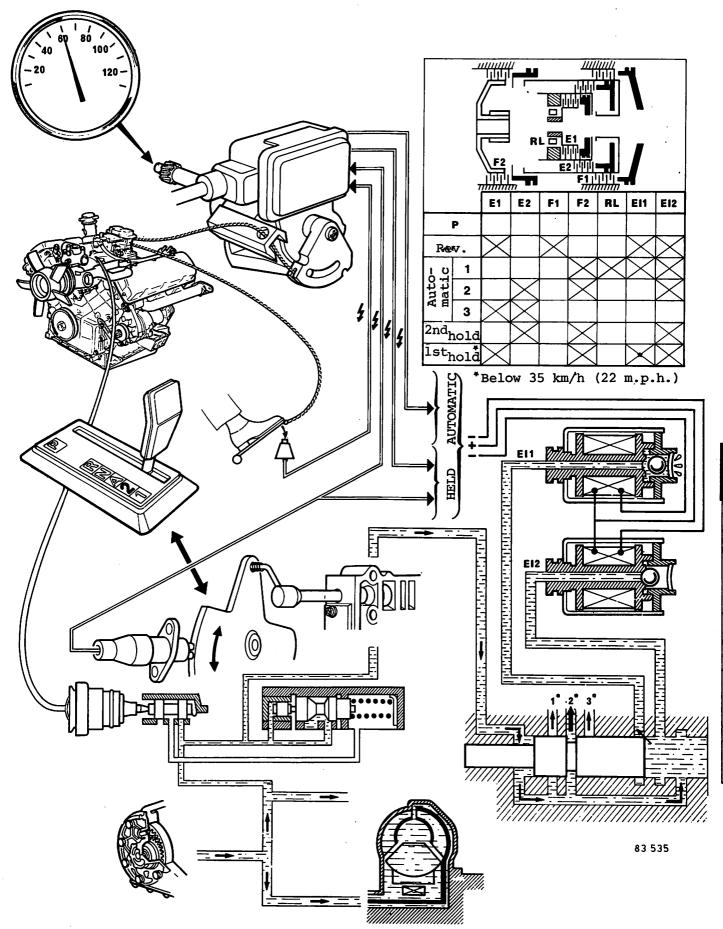




AUTOMATIC TRANSMISSION COMPONENTS

Operating layout





4141 AUTOMATIC TRANSM				
FAULTS	Causes due to transmission auxiliaries	Causes of electrical origin	Causes of hydraulic origin	Causes of mechanical origin
Engine stalls, uneven idling	2-3-4-13			
Creep in "N"	10-►		19 ►	<u> </u>
Excessive creep in A	② → ④ →		Ø	
Slip when moving off in "A" or "R"			① - ② - ⑨ ③ - ②	
Slip when moving off in "A" only				32
Slip during gear changing			12-35-19-	28 - 29-31
Snatch on moving off	2 - 4 -		Ø	
Snatch during gear changing	⑤→	18 →	12 - 13-19 35-36	
Incorrect gear changing speeds	4-5-6-17-	8 - 16 -17 34 -18 -		
No drive in any ratio	1) - 10		19-	23 - 23 - 24 25 - 26 - 27
No drive in 1st and 2nd "automatic"				39
No drive in 2nd or 3rd				2 9
No drive in 3rd, no eng. braking in "R" *				3
No drive in Reverse				30
No drive in 1st Auto. but drive in 1st gear "Hold"				32
No 1st Automatic		8 - 16 - 18 -	19 →	32
No 2nd Automatic		8 - 16 - 18 -	19	
No 3rd Automatic		8 → 16 → 18 →	19	
No lst gear "Hold" No 2nd gear "Hold"	⑩→	8-16-37-18-	19	
Remains in 1st Auto.		8- 16 - 37 - 18 -	19	
Remains in 3rd		7-8-6-8-	19	
Some ratios unobtain- able and selector lever abnormal	10→			33
"Park" facility not working	10 →			<u>3</u>
Starter not working	10-	.8 - 3		
Smoke from exhaust	13			

^{*}or lst gear "Hold"





CHECK LIST

(1)	•	OIL LEVEL
(<u>2</u>)		IDLING
<u> </u>		IGNITION: SPARK PLUGS, CONTACT POINTS, TIMING
4		ACCELERATOR CONTROL
5	•	GOVERNOR CABLE
(a)	•	KICK-DOWN SWITCH ADJUSTMENT
(7)	•	FUSES
8	•	HARNESSES, WIRING, PLUGS, SOCKETS, EARTHS
9	•	COMPUTER SETTING
10		SELECTOR LEVER ADJUSTMENT
(12)		OIL PRESSURE SETTING
13		VACUUM CAPSULE or HOSE
- - - - - - - - - - - - - - - - - - -		GOVERNOR/COMPUTER
1 17		KICK-DOWN SWITCH
18	•	SOLENOID BALL VALVES
19		HYDRAULIC DISTRIBUTOR
20		PRESSURE RÉGULATOR
2 1		STARTER SWITCH
22	A	OIL PUMP
23	A	OIL PUMP SHAFT
24)	A	TURBINE SHAFT
25	A	FINAL DRIVE
26	A	CONVERTER DRIVING PLATE
27	A	CONVERTER
28)	A	El CLUTCH
29		E2 CLUTCH
30)		Fl BRAKE
31)	A	F2 BRAKE
8858388 5	A	FREEWHEEL
33	_	MANUAL VALVE MECHANICAL CONTROL
		ALTERNATOR
		PILOT VALVE
		OIL PUMP GAUZE
W		MULTI-FUNCTION SWITCH

- Adjustment on installed transmission
- Overhaul on installed transmission
- ▲ Overhaul on removed or dismantled transmission.



Description



4141

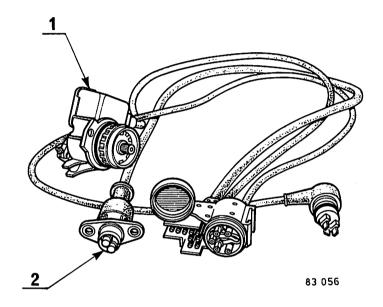
1980 model RENAULT 20 and RENAULT 30 vehicles are fitted with an automatic transmission with moulded plugs for the following connections:

- governor-computer (1)
- multi-function switch (2)
- and the various cables and plugs.

Only the sealed socket may be changed separately.

The design of this harness makes it impossible to confirm that there may be a fault in:

- the governor-computer
- multi-function switch
- or the various cables and plugs.



Because only the solenoid ball valve and kick-down switch functions may be checked using control boxes B.Vi.456-O6, B.Vi.797 or B.Vi.797-O1.

An intermediate harness B.Vi.858 must be used with this new harness in conjunction with control boxes B.Vi.456-O6, B.Vi.797 or B.Vi.797-O1. This intermediate harness must be plugged in to the socket on the R.H. front shock absorber tunnel and checks must be carried out strictly in the sequences given in the following pages.

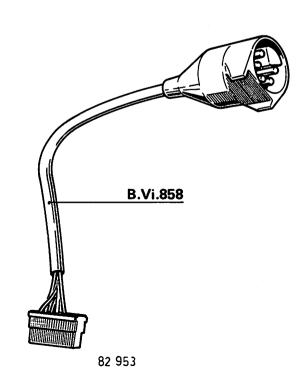
Note also:

1 - When using control box B.Vi.797-Ol.

The positions of the linear switch and governor type selector switch do not affect the control sequence and the buzzer will not sound.

2 - When using control box B.Vi.456-Ol or B.Vi.797

Changeover switch 1 and the buzzer are not used.



272

Code 2105

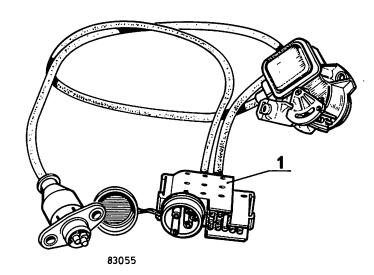
Changing

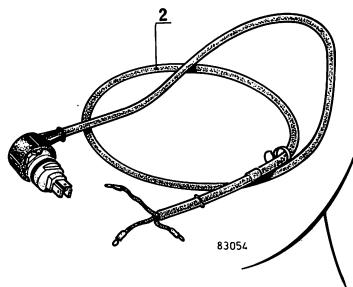


4141

CHANGING THE MOULDED HARNESS:

It is possible with this type of wiring harness to change the governor-computer multi-function switch assembly (1) without interfering with sealed plug and socket (2) and vice versa.



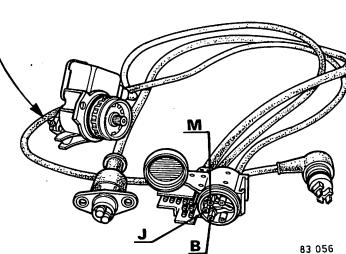


To do this, mark the 3 solenoid ball valve wires (M, J and B), remove them from the plug and separate the sealed plug and socket wiring. This operation makes it unnecessary to remove the automatic transmission sump when the solenoid ball valve and sealed plug and socket wiring are not at fault.

Note: M = Maroon

J = Yellow

B = Blue





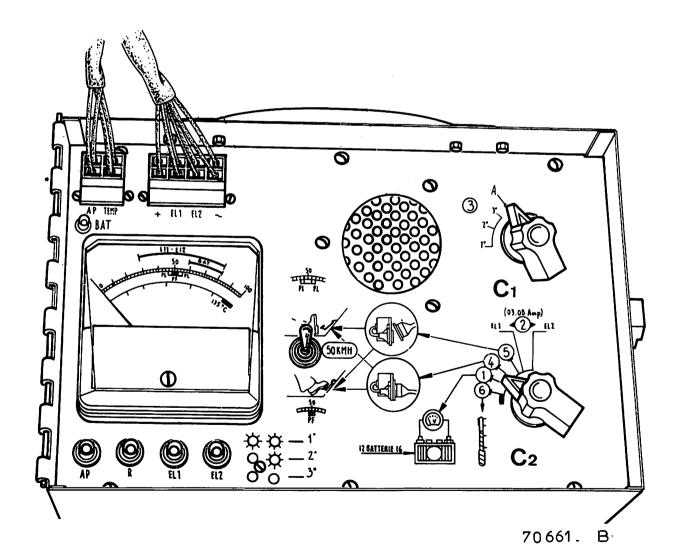
Description



4141

The control box contains:

- an assembly of electrical circuits connected to warning lights
- a meter with graduated scale
- control switches
- a buzzer
- and a 2-tier cover with the harness underneath.





Description



4141

WARNING LIGHTS

Red warning light: BAT

- it illuminates when the control box is switched on.

Blue warning light: ELl

 it illuminates when current is supplied to ELl.

White warning light: EL2

- it illuminates when current is supplied to EL2.

Green warning light: AP

- it indicates the moment the antipollution system starts to work (not used in this instance).

Orange warning light: R

 it indicates the moment the kick-down switch starts to work.

BUZZER

A small loudspeaker gives an audible warning when the governor current reaches maximum.

METER

It has graduated scales, enabling successive readings to be taken of:

- transmission oil temperature (the blacked out sector represents the maximum temperature which must not be exceeded).
- governor current
- battery current with engine switched off or running (O to 100 scale = 20 volts).
- the current strength passing through the ball valve solenoids (the O to 100 scale representing 1 amp).

SWITCH

Used for checking governor and computer.

Cl SWITCH

This switch can be used for 2 purposes:

Position A

To obtain normal driving conditions by means of the selector lever.

Positions 1 - 2 - 3

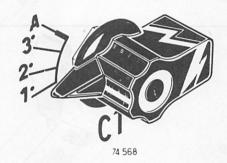
Move the selector lever to A first.

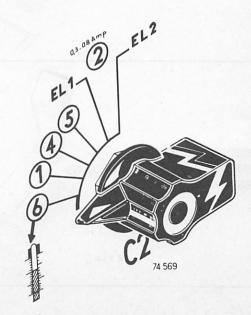
Select ratio desired by turning knob to 1, 2 or 3.

C2 SWITCH

Each one of its positions enables one or other of the following to be checked:

- battery current (1)
- current strength passing through ball valve solenoids EL1 and EL2 (2).
- operation of the governor-computer assembly (4)
- oil temperature (6).







CONTROL BOX B.Vi.454-06 or B.Vi.797

How to use (without moulded harness)



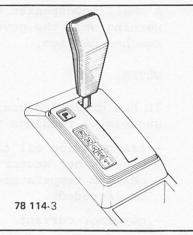
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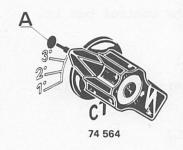
TO CHECK SELECTOR LEVER POSITION

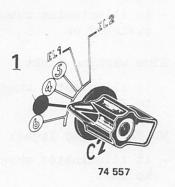
CONTROL

Cl and C2 SWITCHES

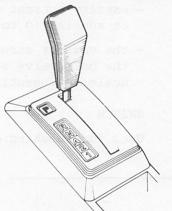


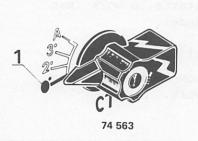


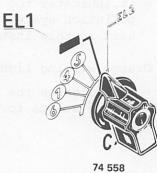




ELl SOLENOID VALVE

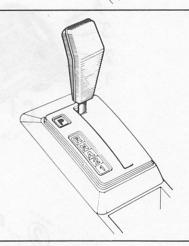


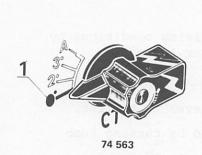






EL2 SOLENOID VALVE

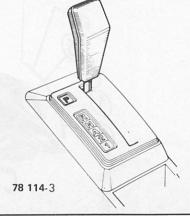


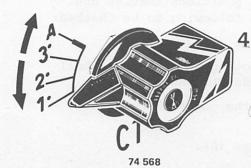


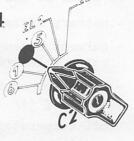


74 582

CURRENT FEED TO SOLENOID VALVES







74 560



How to use (without moulded harness)



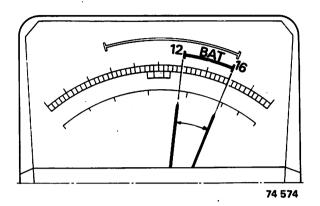
4141

BOX

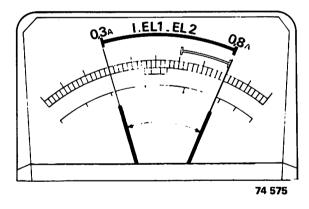
INFORMATION OBTAINED



REMARKS



Incorrect battery voltage (outside 12 to 16 V range) may cause the automatic transmission to malfunction.



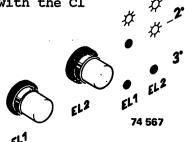
If the current is normal (between 0,3 and 0,8 A), the solenoid valves are electrically in order.

If the current is abnormal, check wires and terminal blocks.

If the above are serviceable, then one of the solenoid valves is faulty.

The computer may be suspect if an incorrect value (outside 0,3 to 0,8 A range) is displayed when the check is made with switch Cl in "A", (the check with Cl in 1 being correct).

The blue and white warning lights for the solenoid valves should go out or light up depending on the selection made with the Cl switch.



If the current supply to the solenoid valves is incorrect, check the wiring and electrical control units.

If the current supply is correct, the fault is either hydraulic or mechanical.



CONTROL BOX B.Vi.454-06 or B.Vi.797

How to use (without moulded harness)



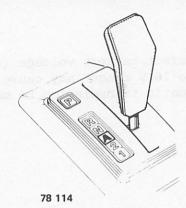
4141

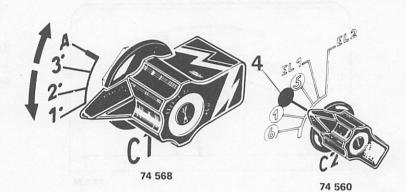
CONTROL

TO CHECK SELECTOR LEVER POSITION

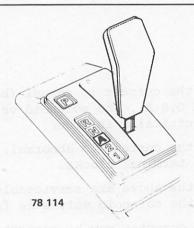
Cl and C2 SWITCHES

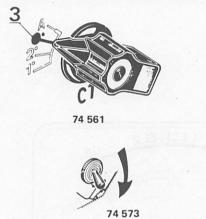


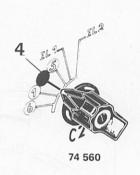




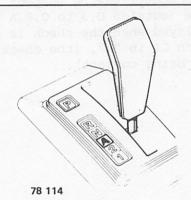
GOVERNOR-COMPUTER

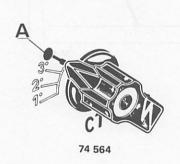


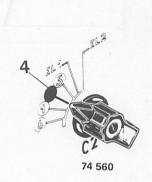




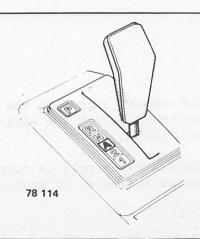
KICK-DOWN SWITCH

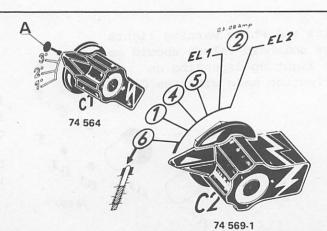






OIL PRESSURE







How to use (without moulded harness)



4141

BOX

INFORMATION OBTAINED

REMARKS

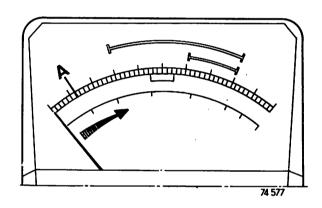
Check the speed on the speedometer.

The various ratios should be obtainable approximately at the speeds given in the table on page 262 when Cl is on A.

If the gearchanging speeds are incorrect, check:

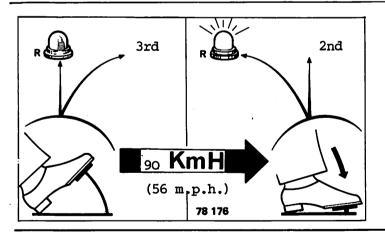
- adjustment of the governor-computer cable,
- connections,
- wiring.

The Cl switch must not be used at speeds in excess of 70 km/h (43.m.p.h.) because the 3 2 downshift will not function and the automatic transmission will remain in neutral.



Current should be obtained up to a value equal to graduation (A) at least.

Change the governor-computer assembly if it delivers nil current.



If the warning light fails to illuminate, check:

- adjustment of kick-down switch;
- the switch itself or connecting wire.

During upshift 2 3, oil temperature 80°C.

Adjust the oil pressure if the values read off are incorrect.



CONTROL BOX B.Vi.454-06 or B.Vi.797

How to use (with moulded harness)

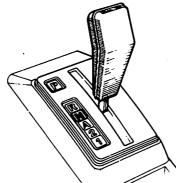


4141

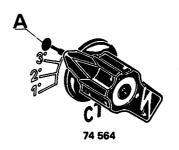
TO CHECK SELECTOR LEVER POSITION

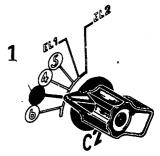
Cl and C2 SWITCHES



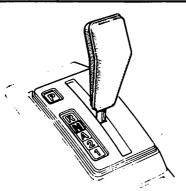


ENGINE STOPPED 78 114-2 IGNITION "ON"



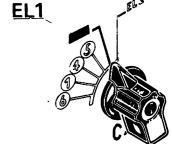


ELl SOLENOID VALVE



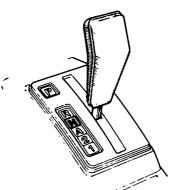
78 114-2 ENGINE STOPPED IGNITION "ON"





74 558

SOLENOID VALVE



ENGINE STOPPED 78 114-2 IGNITION "ON"

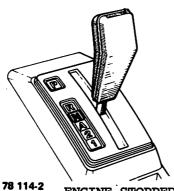


74 563



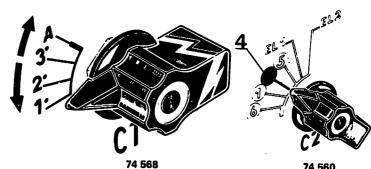
74 582

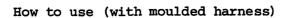
CURRENT FEED TO SOLENOID **VALVES**



ENGINE STOPPED IGNITION "ON"

280

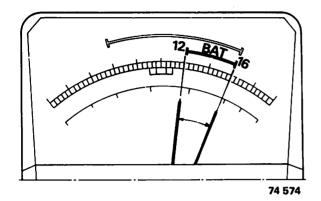




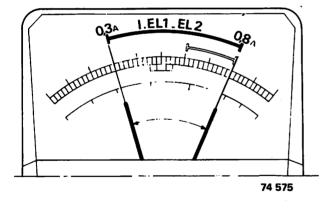
4141

INFORMATION OBTAINED





Incorrect battery voltage (outside 12 to 16 V range) may cause the automatic transmission to malfunction.



If the current is normal (between 0,3 and 0,8 A) the solenoid ball valves are electrically in order.

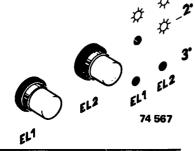
If the current is abnormal check wires and terminal blocks.

If the above are serviceable, then one of the solenoid ball valves is faulty.

* The computer may be the cause if an incorrect value is read off (not within 0,3 A to 0,8 A) when making the check with Cl in A (the check with Cl in l having been satisfactory).

The blue and white warning lights for the solenoid ball valves should remain illuminated.

The blue and white warning lights for the solenoid ball valves should go out or illuminate depending on the selection made with the Cl switch.



Check the wiring and electrical control units if the current supply to the solenoid ball valves is incorrect.

The fault is either hydraulic or mechanical if the current supply is correct.



CONTROL BOX B.Vi.454-06 or B.Vi.797

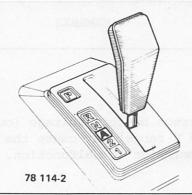
How to use (with moulded harness)

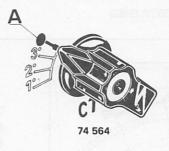


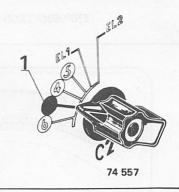
TO CHECK SELECTOR LEVER POSITION

Cl and C2 SWITCHES

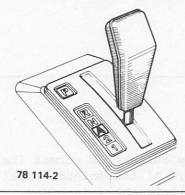
EL1 SOLENOID VALVE

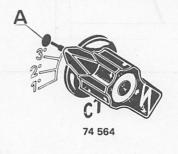


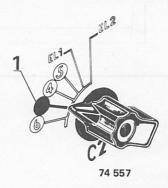




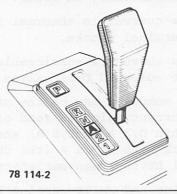
EL2 SOLENOID VALVE

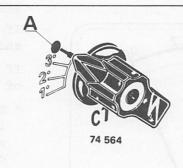


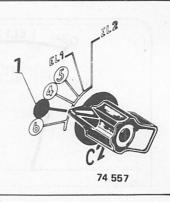




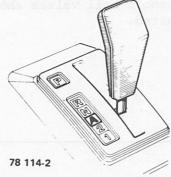
CURRENT FEED TO SOLENOID VALVES

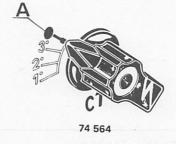


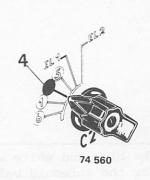




KICK-DOWN SWITCH

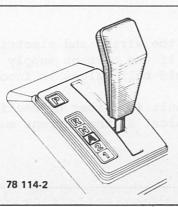




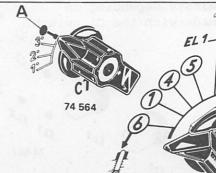


EL2

OIL TEMPERATURE



282







How to use (with moulded harness)



INFORMATION OBTAINED

REMARKS

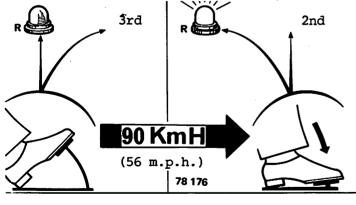
Control box warning lights EL1 and EL2 are illuminated.

Carry out this test while driving along.

Control box warning light ELl is unlit, EL2 remains illuminated.

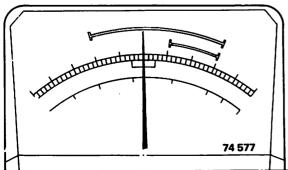
Carry out this test while driving along.

Control box warning lights ELl and EL2 are unlit.



If the RC warning light fails to illuminate, check:

- adjustment of the kick-down switch,
- the switch itself,
- or the connecting wire.



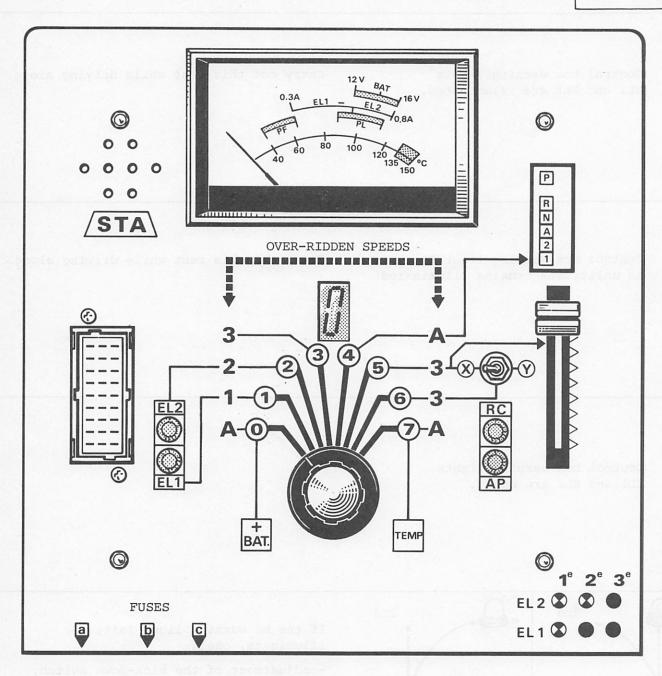
Minimum oil temperature for tests 85° Maximum oil temperature for tests 135°



Description



4141



This is a shockproof container holding the following:

- function warning lights
- potentiometer
- graduated scale and needle (galvanometer)
- digital display
- buzzer
- switches
- 2 cables for connecting to vehicle
- and 3 fuses



Description



4141

Warning lights

- Yellow warning light ELl : illuminates when current is supplied to solenoid valve 1.

- Yellow warning light EL2 : illuminates when current is supplied to solenoid

valve 2.

- Red warning light AP

: indicates anti-pollution system in operation

(US vehicles).

- Green warning light RC

: illuminates the instant the kick-down switch is

activated.

- Digital display

indicates operation of multiple switch and

computer condition.



Simulates governor action.



Switch

For governor type selection



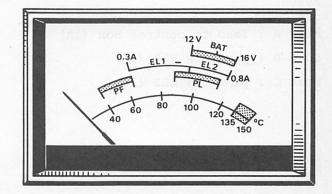
Cables

There are two: the longer connects the control box to the transmission and the smaller serves as an adaptor lead for some types of automatic transmissions.

Galvanometer

There are 4 graduated scales enabling successive readings to be taken of:

- battery current with engine switched off or running
- current strength passing through solenoid valves
- governor current in 2 sectors: full throttle (PF) and light throttle (PL)
- transmission oil temperature (red sector represents maximum temperature which must not be exceeded)











Description

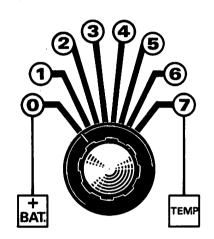


4141

Switch

For selecting all test phases covered by the control box:

- Position O : battery current with engine switched off or running
- Position 2 : measuring EL2 current and feed; (over-riding control of 2nd ratio with selector lever in A on vehicle).
- Position 3 : over-riding control of 3rd ratio with selector lever in A on vehicle (Ell, EL2 not activated).
- Position 4: checking multi-function switch using digital display.
- Position 5: sending impulse to computer to check its operation.
- Position 6: testing governor using galvanometer and buzzer.
- Position 7: measuring transmission oil temperature.

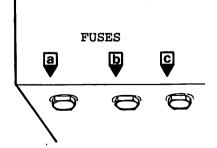


Fuses

Fuse A : feed to control box (1A)

Fuse B : protects EL1 (1A)

Fuse C : protects EL2 (1A)





Connections

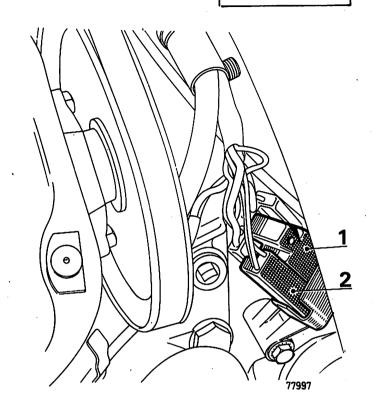


4141

Connections

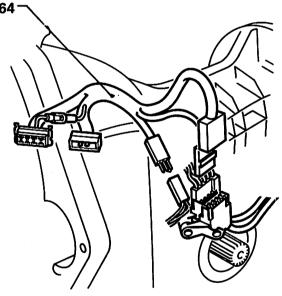
At the automatic transmission end, disconnect:

- bridge (1),
- and junction block (2).



B. Vi. 664

Fit the intermediate harness B.Vi.664 then couple it to the control box harness.



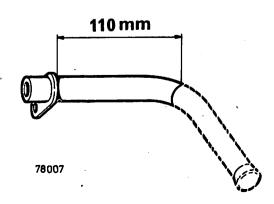
77824

Remove the dipstick.

Take a service part top dipstick tube and cut off the bottom section at the point shown.

This modified top tube will now accept the temperature sensor B.Vi.524.

A tube cut in this way is essential to allow the sensor to be immersed in the oil.





CONTROL BOX B.Vi.797-01

How to use (without moulded harness)



					4141
TO CHECK	SELECTOR LEVER POSITION	SWITCH	⊗ ••		
BATTERY VOLTAGE	ENGINE IDLING			ensi si.	enoktosonod tadotes adi fa adosenocelle (11) spaktday
EL1 solenoid valve			V.E. SERTLE	stalban	
EL2 SOLENOID VALVE		2	ogi kejisnos	end 63	The Lance Leads
CURRENT FEED TO SOLENOID VALVES		23	ofdinegin e to as to kon ille kon ille assai drease al cho as dee	antimeter park to be come and a company to be company to b	Take a service of the bear of



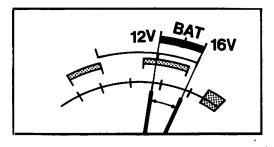
How to use (without moulded harness)



4141

INFORMATION OBTAINED

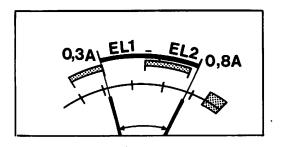




Incorrect battery voltage may cause the automatic transmission to malfunction.

NOTE: this test may also be made when driving along.

Check control box fuses a, b and c if voltage is nil.





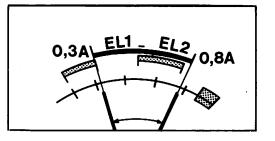
If the current is normal (between 0,3 and 0,8 amp), the solenoid valve is electrically in order.

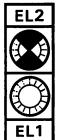
If the current is abnormal:

- check wires and terminal blocks,
- if the above are in order, the solenoid valve is faulty.

NOTE: this test may also be made when driving along.

Check control box fuses, a, b and c if current is nil.





If the current is normal (between 0,3 and 0,8 amp), the solenoid valve is electrically in order.

If the current is abnormal:

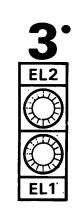
- check wires and terminal blocks,
- if the above are in order, the solenoid valve is faulty.

NOTE: this test may also be made when driving along.

Check control box fuses a, b and c if current is nil.

EL2





If the feed to the solenoid valves is faulty, check cables and electrical control units.

The fault will be either mechanical or hydraulic if the feed is correct.



CONTROL BOX B.Vi.797-01

How to use (without moulded harness)



4141

				4141
TO CHECK	SELECTOR LEVER POSITION	SWITCH	⊗-• ••	
GEAR CHANGING				
MULTI- FUNCTION SWITCH	ENGINE STOPPED IGNITION "ON"	4	AB, O. C.	2 1.13 AE O
COMPUTER	ENGINE IDLING BRAKE APPLIED	5	X③ ·♥	Slowly from top to bottom



How to use (without moulded harness)



4141

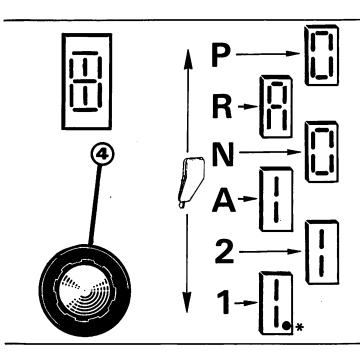
INFORMATION OBTAINED

REMARKS

The various speeds should be obtainable approximately at the speeds given in the table, on page 262.

If the gear changing speeds are incorrect, check:

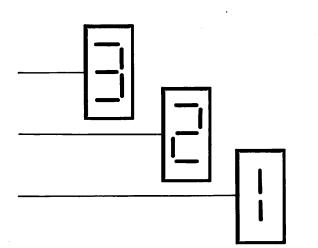
- adjustment of the governor cable
- connections
- and wiring.



Digital display/reading.

If there is a fault:

- check harness
- if the harness is sound, change the multi-function switch.
- * The display of a dot indicates that speed is "held".



For this test:

VEHICLE IN 3RD. GEAR "HOLD" FOR SAFETY REASONS

This test is only valid if the battery current exceeds 12V.

If there is a fault:

- check the harnesses
- if the harnesses are sound, change the governor-computer.



CONTROL BOX B.Vi.797-O1

How to use (without moulded harness)



Slowly from bottom to top

					4141
TO CHECK	SELECTOR LEVER POSITION	SWITCH	⊗ ••••••••••••••••••••••••••••••••••••		
COMPUTER TEST	ENGINE IDLING HANDBRAKE APPLIED	5	X③ ·⊙		from bottom top
COMPUTER	ENGINE IDLING HANDBRAKE APPLIED	5		Slowly	from top to

How to use (without moulded harness)



4141

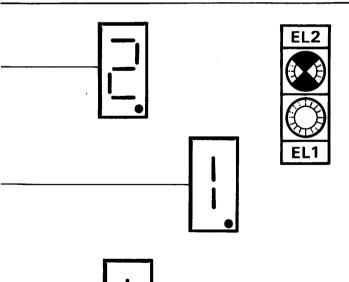
INFORMATION OBTAINED EL2 EL1 EL1

REMARKS

This test is only valid if the battery current exceeds 12V.

If there is a fault:

- check the harnesses,
- if the harnesses are sound, change the governor-computer.



This test is only valid if the battery current exceeds 12V.

If there is a fault:

- check the harnesses,
- if the harnesses are sound, change the governor-computer.

Note: the display of a dot indicates that the ratio is "held" by the control box.



CONTROL BOX B.Vi.797-01

How to use (without moulded harness)



					4141
٠	TO CHECK	SELECTOR LEVER POSITION	SWITCH	⊗ ••••••••••••••••••••••••••••••••••••	
	GOVERNOR CURRENT- "LIGHT THROTTLE" (PL)	SPEED ABOVE 60 km/h (37 m.p.h.)	6		
	GOVERNOR CURRENT- "FULL THROTTLE" (PF)		6	X© •♥	·
	KICK-DOWN SWITCH	SPEED 90 km/h (56 m.p.h.) approx.	7		
	OIL TEMPERATURE		294		





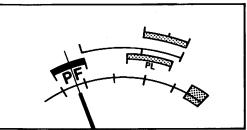
How to use (without moulded harness)

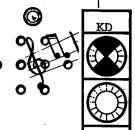
4141

INFORMATION OBTAINED



Release accelerator. The buzzer will sound at about 50 km/h (31 m.p.h.); the needle should then be in the PL zone.





Accelerate hard, kick-down warning light illuminated, and brake at the same time to obtain a speed of 50 km/h (31 m.p.h.) as announced by the buzzer; the needle should then be in the PF zone.

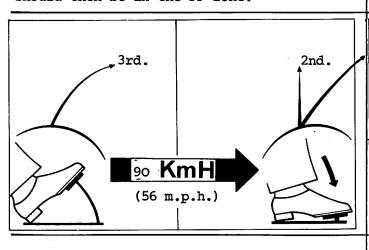
REMARKS

The transmission oil temperature must be 85°C for this test.

If the current measurements read off are within the tolerances and the solenoid ball valves and transmission are correct, check the governor-computer wiring and terminals.

If the latter are correct and the breakdown persists, change the governor-computer.

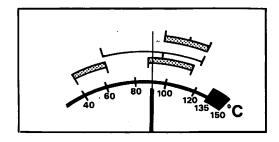
If the current measurements read off are outside the tolerances. there is a fault in the governor or computer.





If the kick-down warning light fails to illuminate, check:

- the kick-down switch adjustment
- the switch itself
- and the connecting wire.



Min. oil temperature for tests 85°C.

Max. oil temperature for tests 135°C.



IGNITION "ON"

CONTROL BOX B.Vi.797-01

How to use (with moulded harness)



Secretary and the second				4141
TO CHECK	SELECTOR LEVER POSITION	SWITCH	deneated For	TAMACIAL
BATTERY VOLTAGE	ENGINE STOPPED IGNITION "ON"			to a contract of the contract
EL1 SOLENOID VALVE	ENGINE STOPPED IGNITION "ON"			Coll Prom Price Leonal Stand
EL2 SOLENOID VALVE	ENGINE STOPPED IGNITION "ON"	2		
CURRENT FEED TO SOLENOID VALVES	ENGINE STOPPED	3		

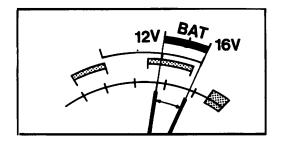
How to use (with moulded harness)



4141

INFORMATION OBTAINED

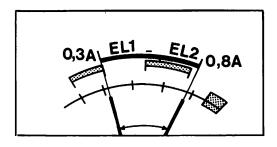


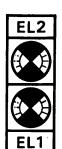


Incorrect battery voltage (outside 12 to 16 V range) may cause the automatic transmission to malfunction.

NOTE: this test may also be carried out when driving along.

Check control box fuses a, b and c if voltage is nil.



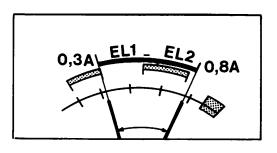


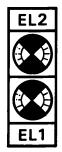
If the current is normal (between 0,3 and 0,8 A) the solenoid valves are electrically in order.

If the current is abnormal:

- check wires and terminal blocks.
- if the above are serviceable, then the solenoid valve is faulty.

Check control box fuses a, b and c if voltage is nil.



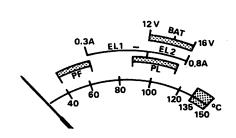


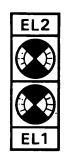
If the current is normal (between 0,3 and 0,8 A) the solenoid valves are electrically in order.

If the current is abnormal:

- check wires and terminal blocks.
- if the above are serviceable, then the solenoid valve is faulty.

Check control box fuses a, b and c if voltage is nil.





If the current supply to the solenoid valves is incorrect, check the wiring and electrical control units.

If the current supply is correct, the fault is either hydraulic or mechanical.



CONTROL BOX B.Vi.797-01

How to use (with moulded harness)

TO CHECK	SELECTOR LEVER POSITION	SWITCH	- 3390,7120	KOTTYURRYDIT
EL1 SOLENOID VALVE				
EL2 SOLENOID VALVE				S 113 ACO
CURRENT FEED TO SOLENOID VALVES		0		E Dayse o



How to use (with moulded harness)



4141

INFORMATION OBTAINED	REMARKS
EL2 EL2 EL1	If the current is normal (between 0,3 and 0,8A), the solenoid ball valves are electrically in order: If the current is abnormal: - check wires and terminal blocks; - if the above are serviceable, then the solenoid ball valve is faulty. NOTE: Carry out this test while driving along. Check control box fuses a, b and c if the current is nil.
2° EL2 © EL1	If the current is normal (between 0,3 and 0,8A), the solenoid ball valves are electrically in order: If the current is abnormal: - check wires and terminal blocks; - if the above are serviceable, then the solenoid ball valve is faulty. NOTE: Carry out this test while driving along. Check control box fuses a, b and c if the current is nil.
3° EL2 © EL1	Check the wiring and electrical control units if the current supply to the solenoid ball valves is incorrect. The fault is either hydraulic or mechanical if the current supply is correct. NOTE: Carry out this test while driving along.

REDUCE VEHICLE SPEED TO BELOW 35 km/h (22 m.p.h.) BEFORE MOVING TO POSITION 7: AS MOVEMENT OVER SWITCH POSITION 1 WILL SELECT 1ST GEAR AUTOMATIC.



CONTROL BOX B.Vi.797-01

How to use (with moulded harness)

TO CHECK	SELECTOR LEVER POSITION	SWITCH	ciqui Atrao	MOTTAMADEZI
KICK-DOWN SWITCH	SPEED 90 km/h (56 m.p.h.) approx.	SEE PREVIOUS PAGE		
OIL TEMP- ERATURE				



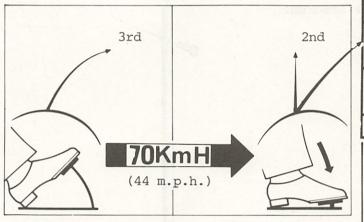
How to use (with moulded harness)



4141

INFORMATION OBTAINED

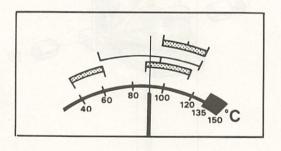






If the kick-down warning light fails to illuminate, check:

- kick-down switch adjustment,
- the switch itself,
- and the connecting wire.



Min. oil temperature for tests 85°C

Max. oil temperature for tests 135°C

- 10



SELECTOR CONTROL

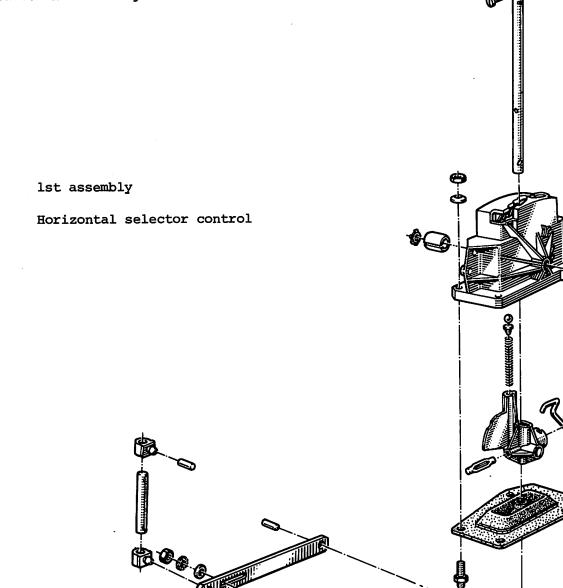




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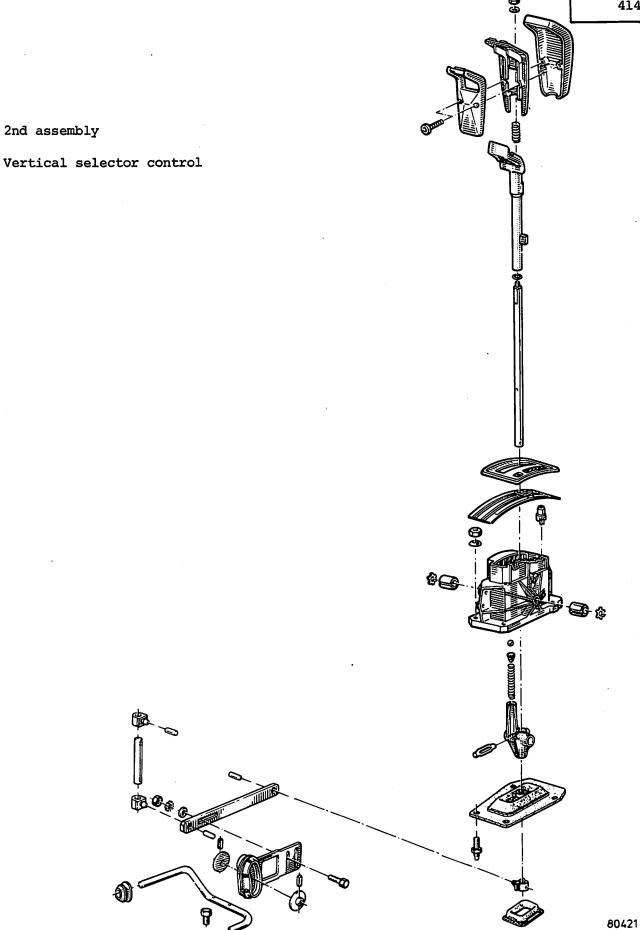
INCIDENTS WHICH COULD BE CAUSED BY THE SELECTOR MECHANISM

- Creep in "N"
- No drive in any ratio
- No 1st gear "hold"
- No 2nd gear "hold"
- Some ratios unobtainable and selector lever abnormal
- Faulty "Park" operation
- Starter not working





4141





Removing - Refitting



CONTROL LEVER

REMOVING

- Remove cover.
- Disconnect linkage at (4).
- Remove the selector lever handle.

On vertical selector control:

- Unscrew the 2 handle screws and the nut on the end and pull the assembly (handle, shaft).

On horizontal selector control:

- Slide the selector gate to remove it.
- Remove the centre bridge piece and housing.
- Unscrew the fixing nuts and remove the lever.

Carry out the removing operations in reverse order to refit.

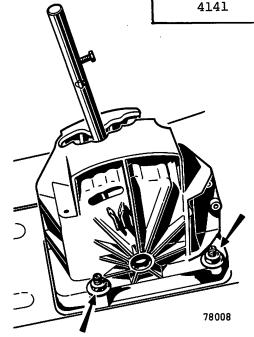
LINKAGE

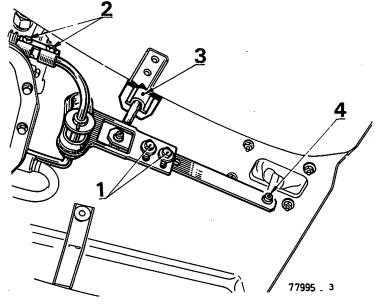
REMOVING

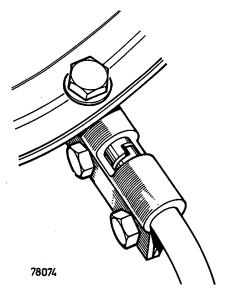
- Remove cover.
- Unscrew nuts (2).
- Remove rods (3) and (4) fixing the linkage to the lever and frame.

REFITTING

- Make sure that the control shaft and linkage butt one against the other.
- Adjust selector mechanism.





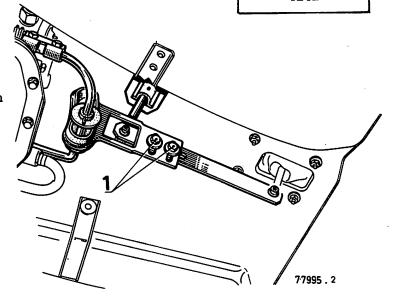


Code 2212

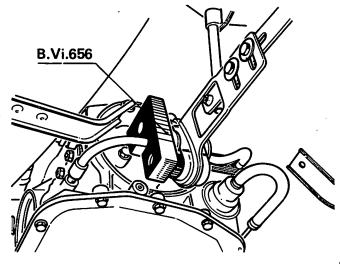
Adjusting



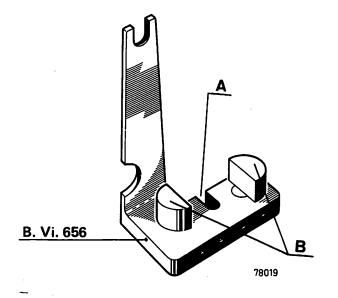
- Place the selector lever in "2nd gear Hold".
- Set the control shaft on the transmission to "2nd gear Hold" (push in as far as possible then withdraw one notch).
- Loosen bolts (1).



- Position tool B.Vi.656 on the kidneyshaped control bar, making certain that the selector lever is still in "2nd gear Hold".
- Tool B.Vi.656 must fit easily without resistance, if necessary, ease as follows:
- at A: file the slot for the control shaft.
- at B: rub the locators which position the tool on the link with emery cloth.
- Tighten the two fixing bolts (1).
- Road test to check that adjustment of the control is correct.







Incidents



4141

INCIDENTS WHICH MIGHT BE DUE TO THE SOLENOID BALL VALVES

- Snatch during gear changing
- Incorrect gear changing speeds
- No 1st gear in Automatic
- No 2nd gear in Automatic
- No 3rd gear in Automatic
- No 1st gear "Hold"
- No 2nd gear "Hold"
- Remains in 1st in Automatic
- Remains in 3rd gear

FAULTY BALL OPERATION

Findings

No 1st a	utomatic:	only	2 / 3 \ 2	operate	ELl	remains	open
No 2nd a	utomatic:	only	1 / 3 \ 1	operate	ELl	remains	_closed
3rd oper	ates only			-	EL2	remains	open
No 3rd	:	only	1 / 2 \ 1	operate	EL2	remains	closed

Diagnosis

(If a sticking ball is the cause). Connect up control box B.Vi.454-06, B.Vi.797 or B.Vi.797-01.

Check the current passing through the ball valve solenoids.

The electrical instructions are being given normally if the current passing through the ball valve solenoids is normal and the ELl and 2 warning lights illuminate at the right moment.

Note: Remember, however, that these instructions may not be able to be carried out (when the solenoid ball valves are stuck).

Use the control box to select the ratios. The missing ratio cannot be obtained if a solenoid ball valve is faulty.

Furthermore, the ELl and 2 warning lights must go out approximately at the speeds given on page 262 in the "Light Throttle", "Full Throttle" and "Full Throttle" with "Kick-Down Switch" positions.



SOLENOID BALL VALVES

Code 2207

Removing - Refitting



4141

Tightening torque:

Sump fixing bolts: 0,3 to 0,4 m.da N ($2\frac{1}{2}$ to 3 lb/ft)

REMOVING

Drain the automatic transmission casing.

Unscrew the fixing bolts and remove the sump.

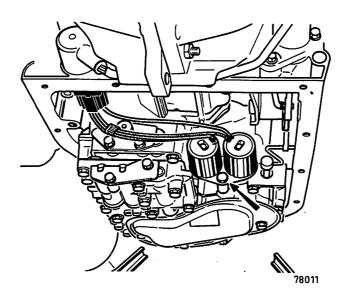
Disconnect the wires, unscrew the retaining plate bolt and remove the solenoid ball valves.

REFITTING

- Fit the solenoid ball valves, making sure that each has its 'O' ring in place. place.
- Fit the retaining plate.
- Reconnect the wires to the sealed socket.
- Refit the sump and torque tighten the bolts.

Fill the transmission with 2,5 litres - Fill the transmission with 2,5 litres (4½ Imp.pts.) of ELF RENAULTMATIC D2 or MOBIL ATF 220 oil and check the level.

- Top up as necessary.





Code 2223

Incidents - Checking - Adjusting



4141

INCIDENTS WHICH MIGHT BE DUE TO INCORRECT OIL PRESSURE:

- Slip on moving off in "A" or "R".
- Slip during gear changing.
- Snatch during gear changing.

Conditions under which the pressure must be checked:

- either during a road test,
- or in the workshop.

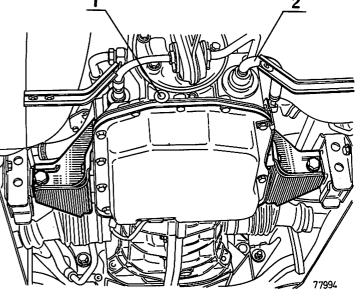
Conditions under which measurements must be taken:

In workshop:

- Connect up the control box.
- Insert the temperature probe.
- Remove plug (1) and connect pressure checking gauge B.Vi.466-O3 in its place.
- Disconnect vacuum capsule pipe (2).
- Raise the front of the vehicle and place the sidemembers on blocks.
- Place the selector lever in "A".
- Select "3rd" with the control box.
- Start the engine. When the temperature of the automatic transmission oil reaches 80°C, run the engine at 2500 r.p.m. and read off the oil pressure: 8 bars + 0,2 (113 psi + 3).

Adjust the oil pressure by turning the vacuum capsule screw if an incorrect reading is obtained.

One complete turn of the screw clockwise increases the pressure by about 0.1 bar $(1\ 1/2\ psi)$.





VACUUM CAPSULE -

PILOT VALVE

Incidents - Checking



4141

INCIDENTS WHICH MIGHT BE DUE TO THE VACUUM CAPSULE:

- Engine stalls, uneven idling.
- Snatch during gear changing.
- Smoke from exhaust.

The vacuum capsule must be checked when the engine is switched off.

Connect the vacuum gauge (to vacuum pump in Diagnostic Bay for instance) to the vacuum pipe.

Apply a vacuum of 524 m/bar approximately to the capsule.

The "Light Throttle" and "Full Throttle" pressures may then be checked if the gauge needle remains steady.

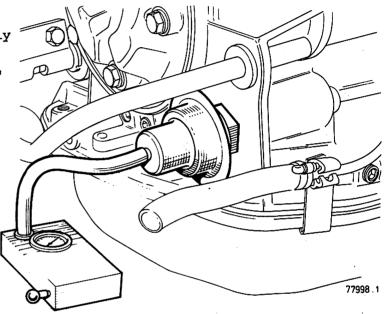
On the other hand, if the needle falls, the capsule or pipe must be changed.

Also make sure that the inlet manifold connection is sound.

Check that the pipe is a tight fit on the capsule and on the union..

An air lock in the capsule or pipe will cause whistling, rough idling, too high a "Light Throttle" pressure and harsh gearshifting under light load.

Automatic transmission oil consumption will increase and blue smoke will issue from the exhaust pipe if a capsule is pierced.



Removing - Refitting

REMOVING

Disconnect the vacuum hose.

Remove the capsule with wrench B.Vi.667.

The pilot valve and sleeve are located behind the vacuum capsule:

 both valve and sleeve must slide freely.

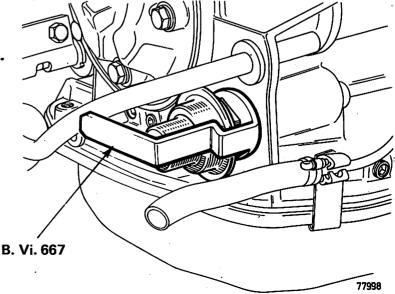
REFITTING

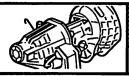
Fit a new seal.

Reconnect the vacuum hose.

Refer to page 305 for refitting the linkage.

Check oil level.





Code 2203

Removing - Refitting



INCIDENTS WHICH MIGHT BE DUE TO THE GOVERNOR-COMPUTER

- Incorrect gear changing speeds
- No 1st gear in Automatic
- No 2nd gear in Automatic
- No 3rd gear in Automatic
- No 1st gear "Hold"
- No 2nd gear "Hold"
- Remains in 1st gear in Automatic
- Remains in 3rd gear

REMOVING

Disconnect the governor control cable.

Remove the fixing bolts.

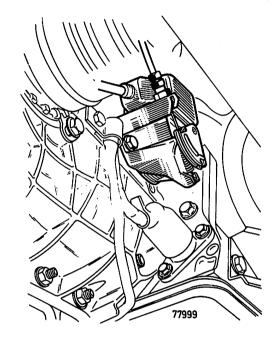
Disconnect bridge (1) and junction block (2).

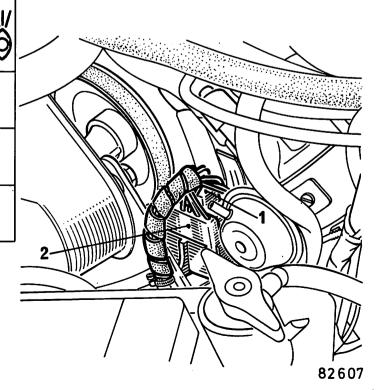
Remove both wiring fixing screws.

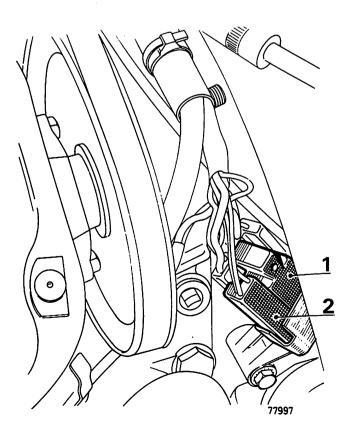
Lift out the governor-computer with its wiring.

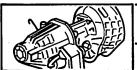
REFITTING

Adjust the cable after refitting.









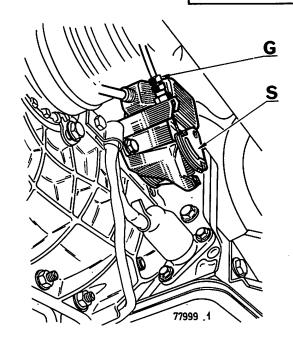
Adjusting

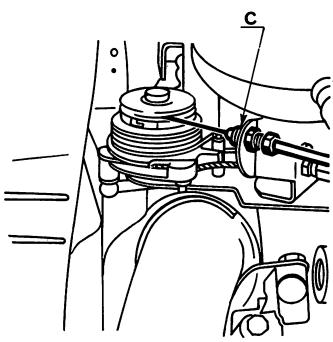


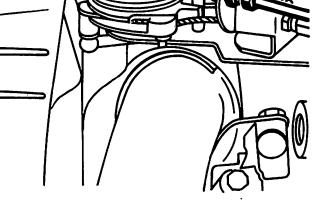
4141

<u>S</u>

- Screw sleeve stop (G) in as far as possible at the governor end.
- Insert the governor control cable into control quadrant (S). Make certain that the sleeve is fully home in the stop.
- Hook the other end of the cable on to the cam at the carburettor end.
- Press the accelerator hard down and tension the cable by adjusting the position of the sleeve in its stop (C) so that quadrant (S) is up against the stop.
- Tighten sleeve stop (C).

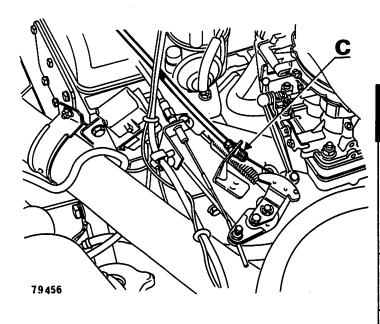


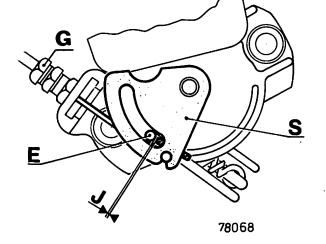






- Slacken off sleeve stop (G) at the governor end to obtain clearance (J) between quadrant (S) and stop peg (E); make certain the throttle butterfly is in "Full Throttle" position during this operation.
- J = 0.3 to 0.5 mm (.012 to .020").
- Tighten the locknut.







MULTI-FUNCTION SWITCH

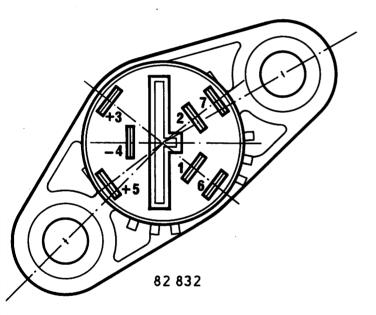
Incidents - Wiring Diagram

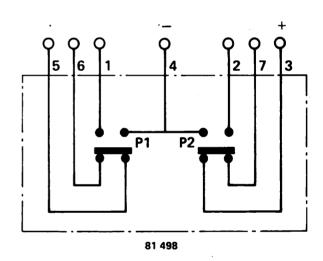


4141

INCIDENTS WHICH MIGHT BE DUE TO THE MULTI-FUNCTION SWITCH:

- No 1st gear "Hold"
- No 2nd gear "Hold" .
- Remains in 1st gear in Automatic
- Starter not working





WIRING DIAGRAM

- 1 Contact to allow engine braking.
- 2 Solenoid ball valve (EL2).
- 3 Reversing light.
- 4 Earth.
- 5 Starter.
- 6 Starter.
- 7 Reversing light



MULTI-FUNCTION SWITCH

Removing - Refitting



4141

REMOVING

Drain the mechanism casing.
Uncouple the connector from the multifunction switch.
Unscrew both bolts holding the switch
and remove it.

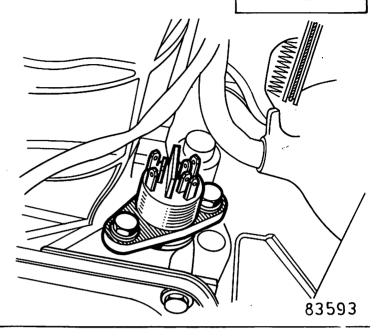
Code 2101

REFITTING

There are no special points concering refitting.
Refill the mechanism casing with recommended oil: ELF RENAULTMATIC D2 or MOBIL ATF 220 (pour in about 2,5 litres (4½ Imp.pts.) then check the level.

Top up as necessary.

Check the oil level in the final drive casing and top up as necessary.

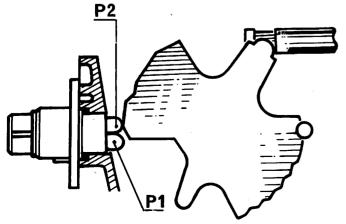


Switch functions

SELECTOR LEVER POSITION	Pl PLUNGER - STARTING	P2 PLUNGER - REVERSING LIGHT
P	1	0
R	0	1
N	1	0
A - 1 - 2	0	0

1 - Contact should be made

O - Contact should not be made





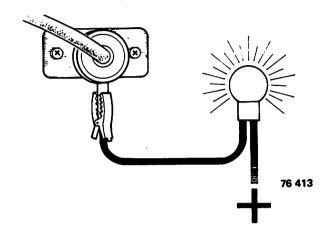
Checking



4141

The kick-down switch is checked by connecting a test bulb between the switch and the battery + post or by using the control box during a general check.

The test bulb or orange warning light in the control box will illuminate, indicating that the circuit is sound, when the accelerator is pressed hard down.



Code 2210

Removing - Refitting - Adjusting

INCIDENT WHICH MIGHT BE DUE TO THE KICK-DOWN SWITCH

- Incorrect gear changing speeds

REMOVING

The accelerator cable must be changed as the kick-down switch is integral with it.

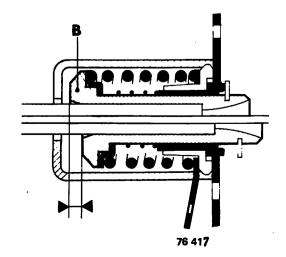
ADJUSTING

The accelerator cable is used for adjustment.

Make sure that the accelerator cable has sufficient initial play to allow stop sleeve (B) movement of 3 to 4 mm (1/8 to 5/32") when the accelerator is pressed hard down.

Make sure the cover is tight to prevent oxidation of the contacts.

The travel of the accelerator pedal, kick-down switch setting and governor control cable adjustment are all closely related; they must, therefore, be checked and adjusted together.





HYDRAULIC DISTRIBUTOR

Incidents



4141

INCIDENTS WHICH MAY BE DUE TO THE HYDRAULIC DISTRIBUTOR

- Slip on moving off in "A" or "R"
- Creep in N
- Slip during gear changing
- Snatch on moving off
- Snatch during gear changing
- No drive in any gear
- No 1st gear in automatic
- No 2nd gear in automatic
- No 3rd gear in automatic
- No 1st gear "Hold"
- No 2nd gear "Hold"
- Remains in 1st automatic
- Remains in 3rd gear

Code 2225

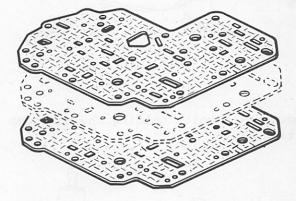
Removing - Refitting

REMOVING

- Drain the oil from the mechanism casing.
- Remove the sump bolts and sump.

Take out both gaskets and the plate.

Identifying hydraulic distributors: see chapter "Specification".



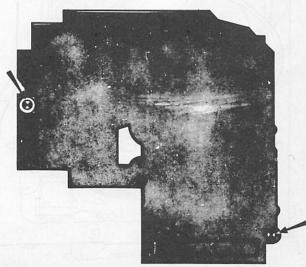
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2

REFITTING

Both new gaskets and the new plate supplied with the new distributor must be fitted.

Cut the head off two M6 125 x 60 bolts, saw cut a screwdriver slot in each and use them at (C) and (D) to locate the distributor and gaskets.



79442

HYDRAULIC DISTRIBUTOR

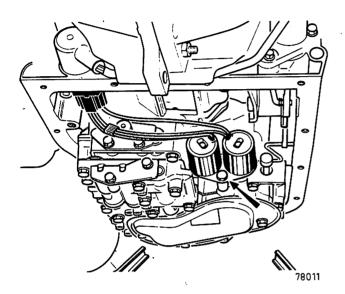


Removing

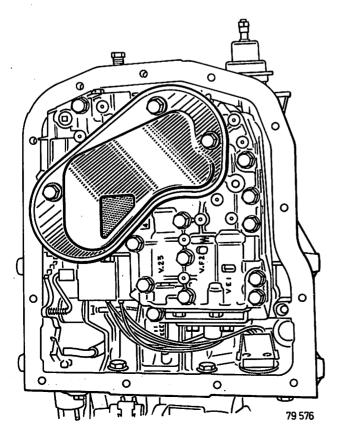


4141

Remove the bolts holding the solenoid ball valves retaining plate, disconnect their wires, and remove the valves.



Remove the 3 bolts holding the oil pump suction gauze.

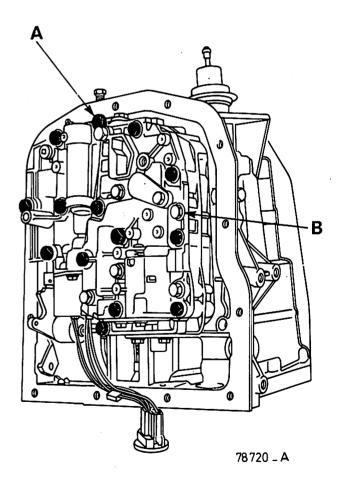


WARNING

There are 5 bolts holding the secondary distributor to the main distributor. They are shown below as unshaded and must not be removed.

A - bolts to be unscrewed (black heads).

 \boldsymbol{B} - bolts not to be touched (unshaded).





HYDRAULIC DISTRIBUTOR

Refitting

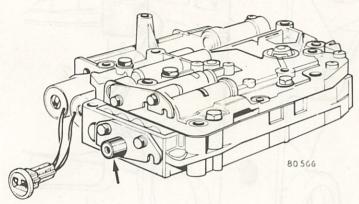


4141

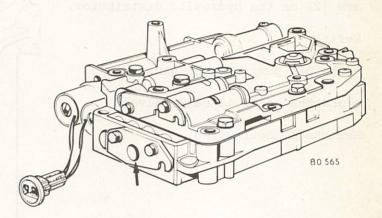
Torque tighten the bolts to the recommended value in the correct sequence as shown below.

1st PATTERN DISTRIBUTOR

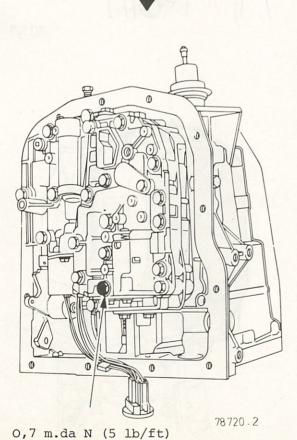
2nd PATTERN DISTRIBUTOR

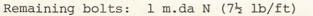


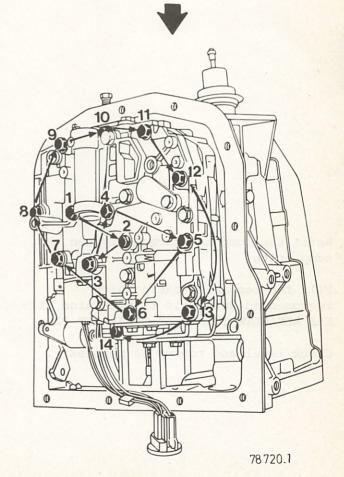
With cup



Without cup







All bolts: 1 m.da N (7½ lb/ft)

Refitting



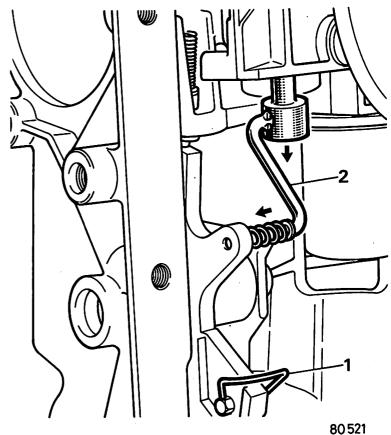
4141

Refit the manual valve with control arm (2) on the hydraulic distributor.

Refit:

- the oil pump suction gauze.
- and the solenoid ball valves.

Reconnect their wires.

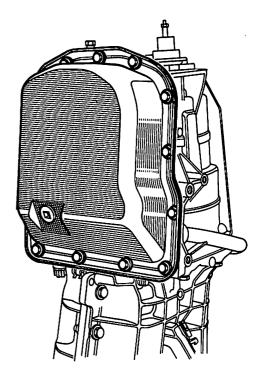




Refit the sump and torque tighten the sump bolts.

Fill the mechanism casing with recommended automatic transmission oil: ELF RENAULTMATIC D2 or MOBIL ATF 220.

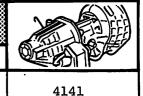
Check level and top up as necessary.





CONVERTER

Incidents



INCIDENTS WHICH MAY BE DUE TO THE CONVERTER

- Excessive "Creep" in "A".
- Slip on starting off in "A" or "R".
- No drive in any gear.

Codes 228 - 2264

Removing - Refitting

REMOVING

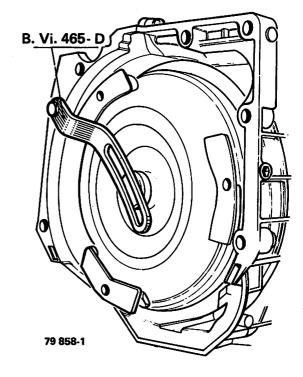
The automatic transmission must be removed for this operation.

Remove retaining plate B.Vi.465 mark D holding the converter temporarily.

Pull the converter towards you and lift it off.

Check the condition of:

- the converter locating ball (crankshaft end),
- oil seal bearing surface,
- converter white metal sleeve and freewheel,
- cooling slats,
- the three securing points.



REFITTING

It is advisable to hold the transmission vertical in order to make the operation easier when refitting the converter.

Fit the converter retaining plate.

Protect the joint face with a plastic sleeve when handling the converter.



OIL SEAL

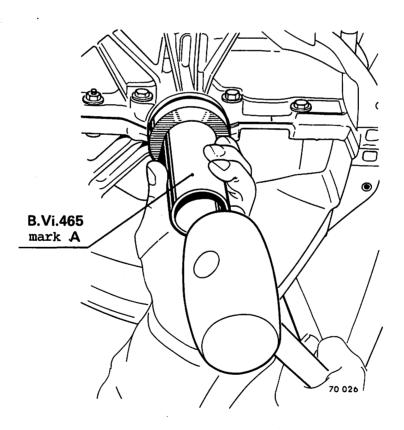
Code 1020 Removing - Refitting

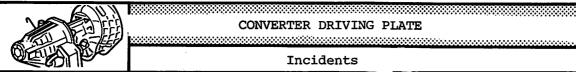


4141

The automatic transmission must be removed for this operation.

- Once the converter has been removed, extract the old oil seal (use a burr-free tool to avoid damaging the casing bore).
- Check the condition of the smooth part of the centre stator support.
- Lubricate the new seal sparingly and fit it onto the chamfer.
- Use tool B.Vi.465 mark A to locate it and tap gently.
- Lubricate the seal bearing surface with recommended oil and refit the converter.





CONVERTER DRIVING PLATE

Incidents



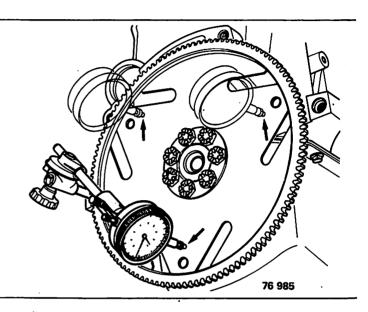
INCIDENTS WHICH MAY BE DUE TO THE DRIVING PLATE:

4141

- No drive in any gear

Checking

- Arrange a clock gauge and bracket to obtain a reading near each converter fixing hole.
- Compare the readings: Max. permissible run-out 0,3 mm (.012").
- Change the driving plate if this tolerance is exceeded.



Code 2229

Removing - Refitting

The automatic transmission or engine must be removed for this operation.

SPECIAL TOOLS

Methods reference	Description	Essential	Useful	Specifically for vehicle
Mot.582 Mot.50	Locking sector Torque wrench	0		

TIGHTENING TORQUE

Driving plate fixing bolts 6,5 to 7 m.da N (50 to 52½ lb/ft)

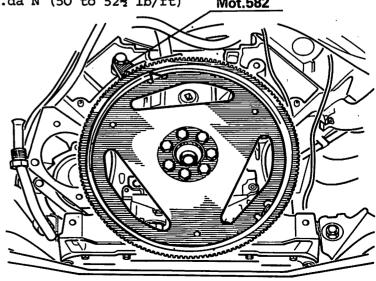
Mot.582

REMOVING

- Fit locking sector Mot.582 to prevent the driving plate from turning.
- Unscrew the 7 fixing bolts around the centre (these bolts must not be re-used).
- Remove the driving plate.

REFITTING

- Smear the threads on the 7 new selflocking bolts with Loctite "Frenetanch" or equivalent.
- Fit locking sector Mot.582 and torque tighten the bolts.
- Remove the locking sector.



CONVERTER DRIVING PLATE

Identification



4141

		<u>. </u>
CONVERTER	DRIVING PLATE	SPECIAL FEATURES
80 422	80 422	l T.D.C. hole in converter. Position converter with its timing hole in line with the dab of paint on driving plate.
K240	Max.run-out 0,3 mm (.0012")	
80 422	80 422	l T.D.C. hole in driving plate.
R240	Max run_out 0.3 mm (0012")	
80 422	Max.run-out 0,3 mm (.0012")	2 T.D.C. holes on driving plate.
	R240 80 422 R240 80 422	R240 Max.run-out 0,3 mm (.0012") 80 422 R240 Max.run-out 0,3 mm (.0012")

Code 2045

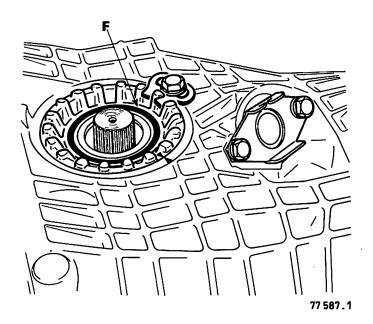
Changing



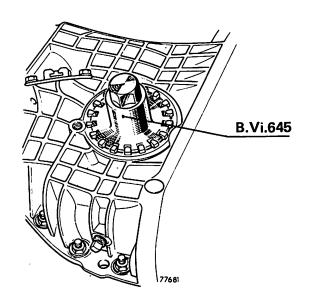
(R. 1272, R. 1273, R. 1275, R. 1278)

The oil seal may be removed without disturbing the differential ring nut.

- Drain the final drive casing.
- Withdraw the drive shaft from the sunwheel on the side concerned.
- Extract the old oil seal with s suitably shaped hook.
 Lubricate the new seal.



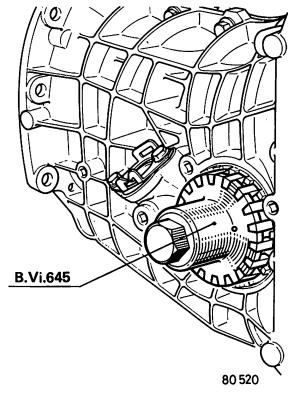
- Fit the new oil seal to the ring nut using inserting tool B.Vi.645 (it must be flush with face (F) on the nut).
- Refit the drive shaft.
- Refill the final drive casing with recommended oil.



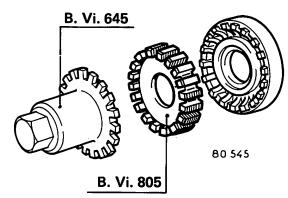
(R. 1271)

414

The oil seal cannot be removed on its own. The ring nut-oil seal assembly must be changed.



- Drain the final drive casing.
- Withdraw the drive shaft from the sunwheel on the side concerned.
- Mark the position of the ring nut in relation to the casing.
- Remove the lockplate.
- Unscrew the ring nut with tools B.Vi.
 805 and B.Vi.645. Count the number of turns required to clear the threads.



- Change the ring nut-oil seal assembly and screw it in, counting the number of turns noted on dismantling. Line up the marks.
- Refit the lockplate.
- Refit the drive shaft.
- Refill the final drive casing with recommended oil.

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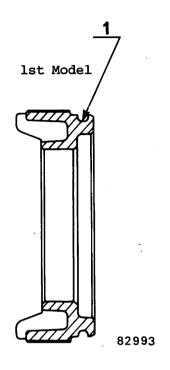


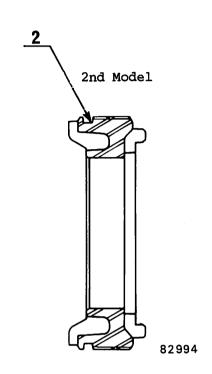
Interchangeability



4141

Differential ring nut





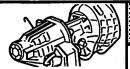
1 - "O" ring on inside

- 2 "O" ring on outside
 - not interchangeable with 1st Model

A deflector is fitted to the 2nd Model to provide seal lubrication. It varies according to the automatic transmission suffix.



AUTOMATIC TRANSMISSION



Codes 2227-2269

Removing - Refitting

4141

SPECIAL TOOLS

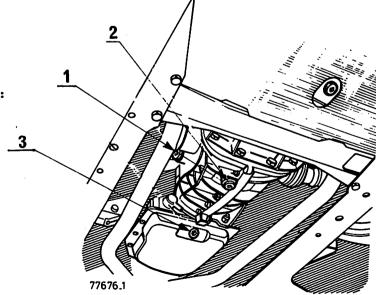
Methods reference	Description	Essential	Useful	Specifically for vehicle
Mot.593 T.Av.603 B.Vi.606 T.Av.476 Mot.50 T.Av.509-01 B.Vi.31-01	Drain plug wrench Front axle spacer legs Set of rollpin drifts Ball joint extractor Torque wrench Front axle spacer legs Set of rollpin drifts		,	

TIGHTENING TORQUES

Roadwheel nuts	6 to	8	m.da	N	(45	to 60 lb/ft)
Suspension top ball.joint nut R.1271		5	m.da	N	(37 ½	lb/ft)
Suspension top ball joint nuts R.1272,						
R.1273, R.1275		6	m.da	N	(45	lb/ft)
Steering arm ball joint nut	3,5		m.da	N	(26	lb/ft)
Converter fixing bolts	3 to	3,5	m.da	N	(22½	to 26 lb/ft)

REMOVING

- Disconnect battery.
- Using drain plug wrench Mot.593, drain:
 - the final drive casing,
 - and mechanism casing.

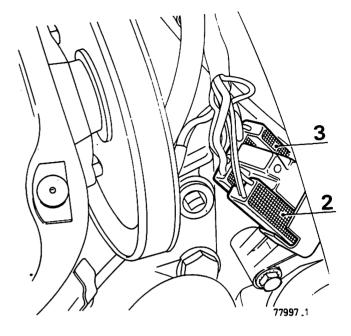


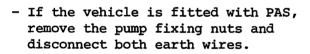
Removing



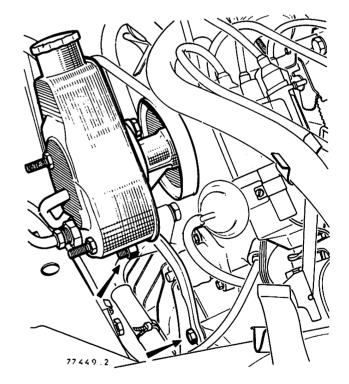
4141

- Unscrew both nuts holding the harness bracket.
- Disconnect the vacuum pipe.
- Disconnect junction blocks (2) and (3).





- Remove the exhaust pipe clamps.
- Remove the top 2 fixing bolts between engine and automatic transmission and disconnect the earth strap.



AUTOMATIC TRANSMISSION

Removing

- Insert spacer legs T.Av.603 between the shock absorber lower fixing pins and the lower suspension arm pivot pins.
- Place vehicle so that wheels are hanging free and check that spacer legs T.Av.603 are in their correct positions.

Note: Use spacer legs T.Av.509-01 on the R.1271.

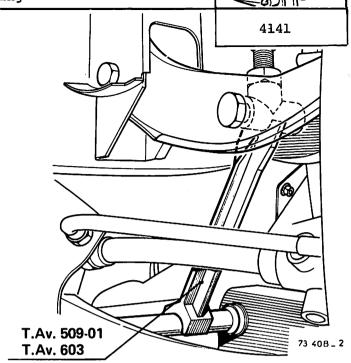
- Punch out the drive shaft rollpins using drift B.Vi.606 or B.Vi.31-Ol for R.1271.
- Remove the nuts from the following and separate using extractor T.Av.476:
- the steering arm ball joints,
- and upper suspension arm ball joints.
- Tilt the half-axles, freeing the drive shafts from their sunwheels at the same time.

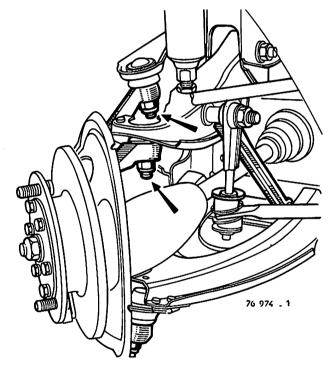
R.1271 - R.1272

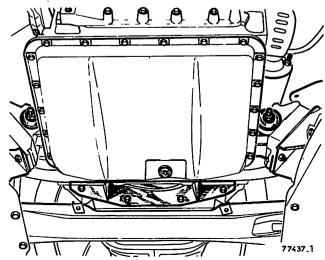
 Disconnect the downpipe from the manifold.

R.1273 - R.1275 - R.1278

- Remove both downpipes.
- Remove the engine undertray.
- Remove the T.D.C. sensor bracket and driving plate cover.





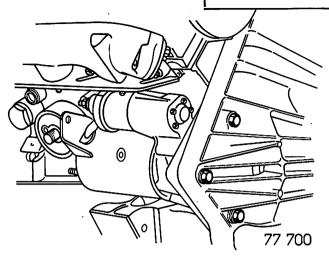


Removing



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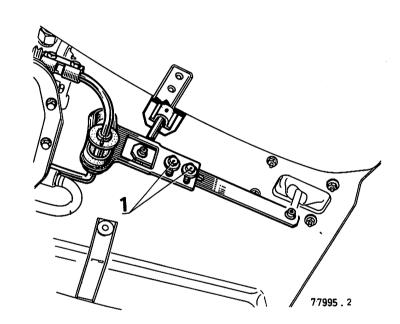
- Remove the 3 starter fixing bolts and push the starter forward.



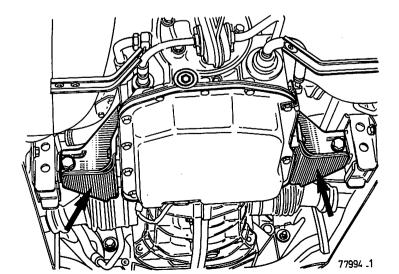
- Remove the cover and disconnect the selector control by unscrewing both bolts (1).

Disconnect:

- the oil cooler hoses except on the R.1271 (unless fitted).
- the governor-computer cable. Remove the 3 bolts securing the converter to the driving plate.



- Place the Desvil 701 ST jack under the transmission.
- Remove the side mountings.
- Remove the remaining bolts holding the automatic transmission to the engine and lower the transmission on the jack.



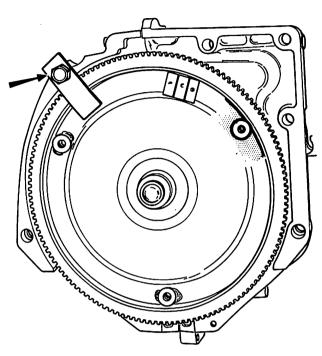




AUTOMATIC TRANSMISSION

Removing - Refitting

As soon as the transmission has been removed, fit retaining plate B.Vi.465, mark D, in position to prevent the converter from separating.



REFITTING

70 012 .3

Fitting the converter to the automatic transmission:

- at the transmission end:
 - lubricate the white metal bush and rotating seal bearing surface with automatic transmission oil.
- at the engine end:
 - . lubricate the crankshaft location with Molykote BR2 grease.

Re-assembling the transmission to the engine:

Make sure that the locating dowels are in position.

Align the driving plate. (See chapter "Specifications").

The 3 fixing holes must line up with

The 3 fixing holes must line up with the converter bosses.

Make sure that the above is correct before tightening the engine-transmission fixing bolts.

Once the engine and transmission are bolted together, the converter and driving plate turn as one.

Insert the 3 converter fixing bolts in the driving plate.

Turn the engine before tightening the bolts to the recommended torque.

Refit:

- the drive shafts,
- and wiring harnesses.

Adjust:

- the governor cable,
- and selector control.

Fill the following with recommended oil:

- final drive casing,
- and mechanism casing.

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Code 2272 Dismantling - Re-assembling



4141

SPECIAL TOOLS

Methods reference	Description	Useful	Essential	Specifically for vehicle
B. Vi. 711	Circlip removing tool for El freewheel			
B. Vi. 712	Circlip removing tool for El piston			
B. Vi. 714	Dismantling tool for E2-F1 assemblies			
B. Vi. 713	F2 piston spring compressing tool			
B. Vi. 715	Transmission operating clearance adjusting tool		0	

TIGHTENING TORQUES

Oil pump cover bolts 1,1 m.da N (8 lb/ft)

F2 brake housing bolts 1,5 m.da N (11 lb/ft)

Sump bolts $0.3 \text{ to } 0.4 \text{ m.da N } (2^{\frac{1}{2}} \text{ to } 3 \text{ lb/ft})$

-

Hydraulic distributor fixing bolts Refer to chapter "Refitting hydraulic distributor"



Dismantling



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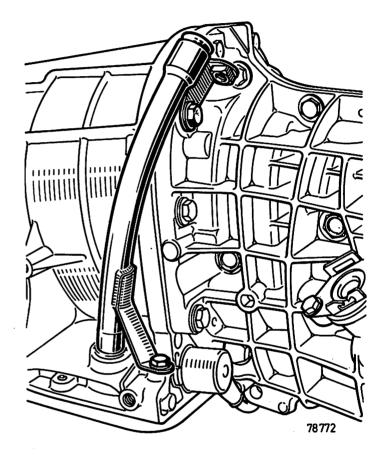
A bench covered with rubber or thick plastic sheeting is required when dismantling and handling the components.

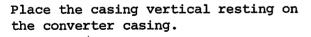
SEPARATING CASINGS

Remove converter.

Remove pump shaft.

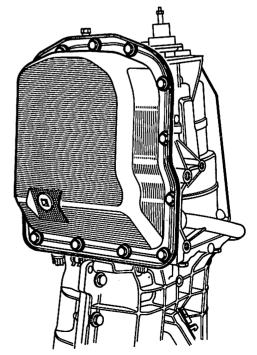
Remove the 2 bolts holding the dipstick tube.





Unscrew sump fixing screws and remove sump and gasket.

Disconnect the multiple switch harness, remove both bolts and switch.

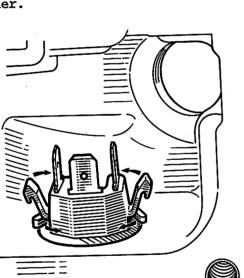




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Disconnect the solenoid ball valves harness after moving the retaining lugs.

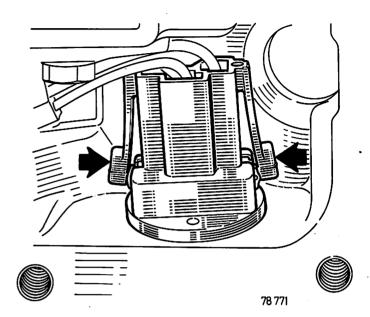
Remove the sealed socket by pressing the two plug retaining lugs and locking lugs together.

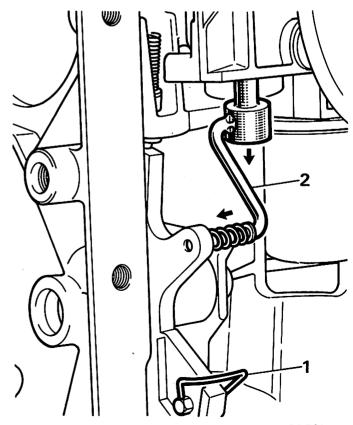


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Remove:

- clip (1) on the toothed quadrant and remove the "Park" locking finger.
- manual valve control (2), taking care not to drop the manual valve.





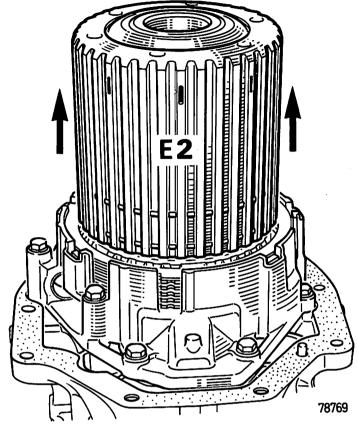




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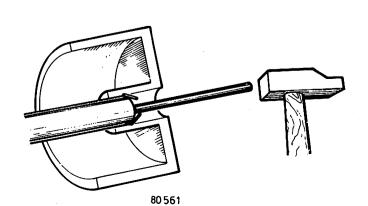
Remove the bolts securing the mechanism casing to final drive casing and lift up to remove.

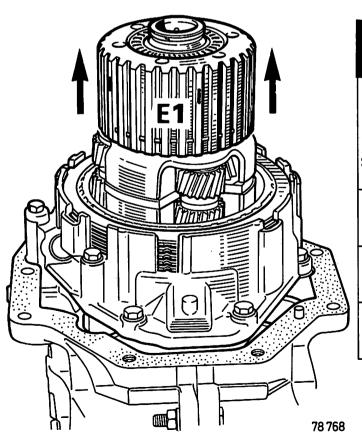
Extract the E2 clutch vertically.



Extract the El clutch vertically with the turbine shaft after removing the needle roller bearing.

Remove the turbine shaft from the El clutch using a bronze drift.



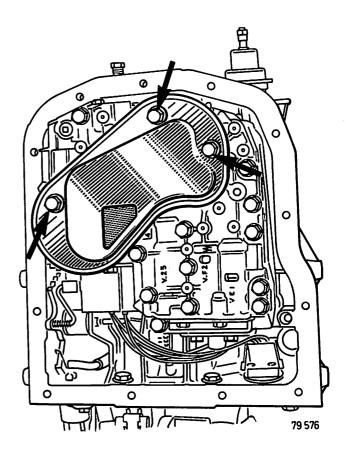






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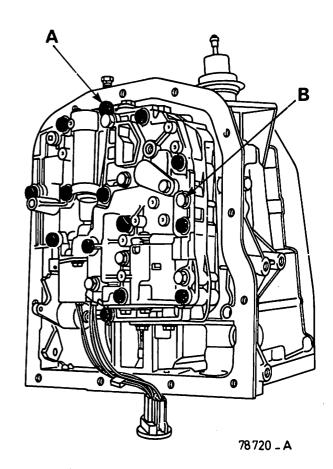
Unscrew the three bolts holding the oil pump suction assembly and remove it with its gasket.



Unscrew the hydraulic distributor fixing bolts and remove it.

The five bolts securing the secondary distributor to the main distributor must not be removed.

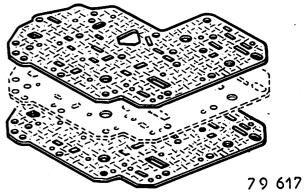
- A Bolts which may be unscrewed (shaded black on sketch).
- B Bolts not to be touched (outlined only on sketch).





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Remove the plate and 2 gaskets.

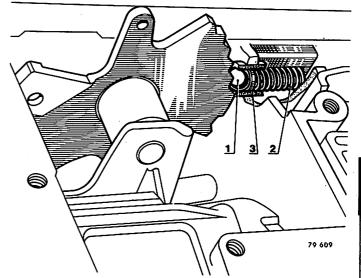


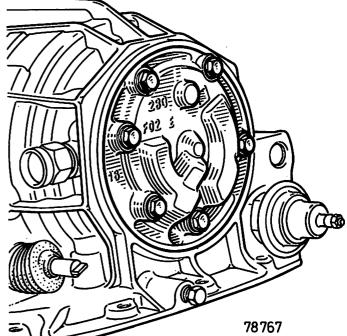
QUADRANT AND CONTROL SHAFT ASSEMBLY

Remove the above only if it is the cause of an incident. Tap out the quadrant spindle and catch:

- the plug,
- ball (1) with plunger spring (2),
- remove the control shaft.

Note: Do not refit rubber damping pad (3) when re-assembling.





OIL PUMP

Remove the 6 securing bolts and withdraw the pump with 2 gears and drive.

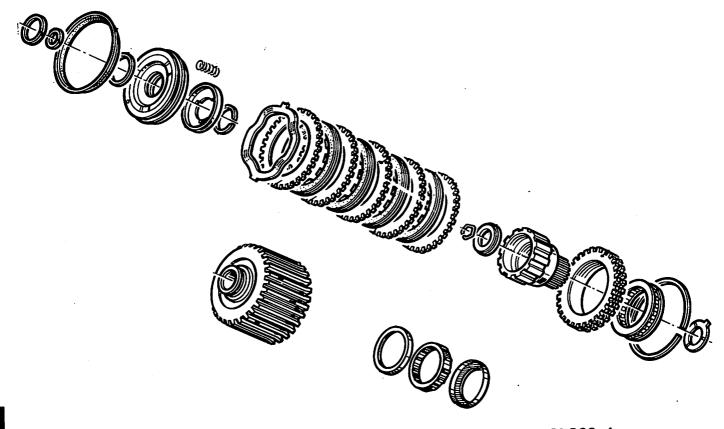
Mark the assembly position of the 2 gears.





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El CLUTCH

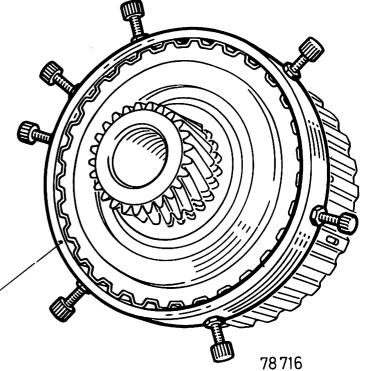


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Use tool B.Vi.711 to compress the freewheel retaining circlip, remove freewheel and (P1) sunwheel.

Remove the needle thrust bearing.

Remove the lined discs, steel discs and wave-form disc.



B.Vi.711-



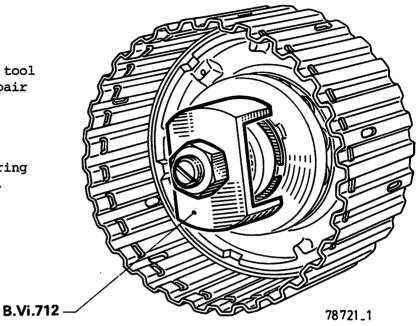


4141

Compress the El piston springs with tool B.Vi.712 and remove circlip with a pair of circlip pliers.

Remove thrust cup and springs.

Remove the piston by pulling the spring locating pegs with a pair of pliers.



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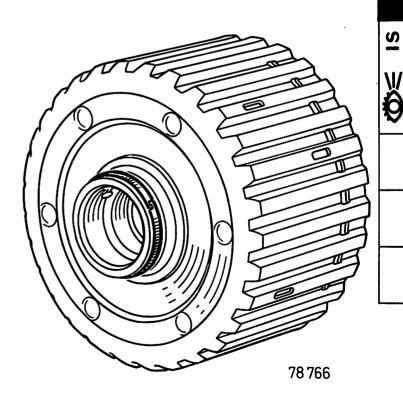
Remove the piston seals and sealing ring on the housing.

Dismantling the freewheel:

Separate the El clutch hub from the freewheel outer track ring.

Remove the following from the outer track ring:

- thrust sleeve,
- freewheel,
- and thrust sleeve.

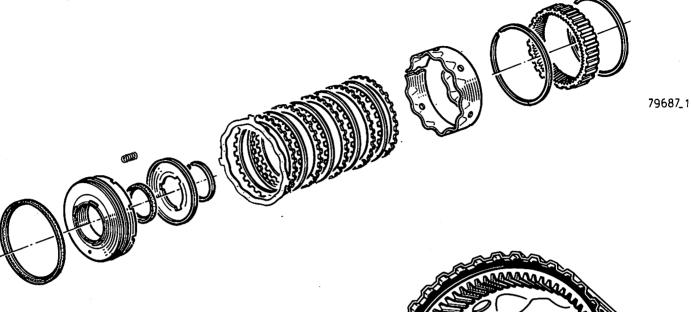


Dismantling

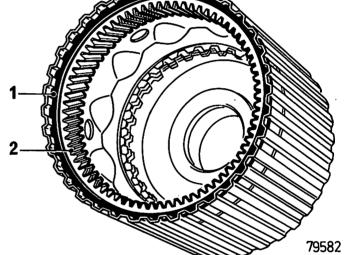


E2 CLUTCH

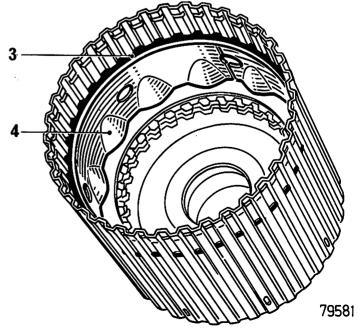
4141

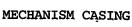


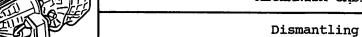
Remove circlip (1) holding ring (2) and remove the ring.



Remove circlip (3) and spacer plate (4).









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Retain the steel discs, lined discs and wave-form disc.

Compress the E2 piston return springs with tool B.Vi.714 to free it then remove the thrust plate circlip.

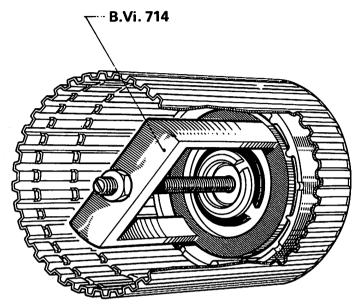
Slot the head of the tool screw as shown. Hold the threaded rod stationary with a screwdriver to make the operation easier. Retain the springs.

Remove the piston by hand or expel it with compressed air.

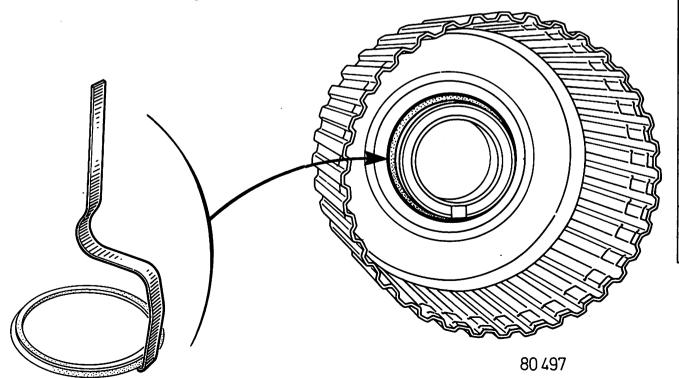
Remove piston seals.

WARNING: The inner seal inside the bellhousing hub must only be removed if it is to be changed.

Use a hook shaped as shown to remove the seal in the hub. Insert it under the lip and ease the seal out of its groove.



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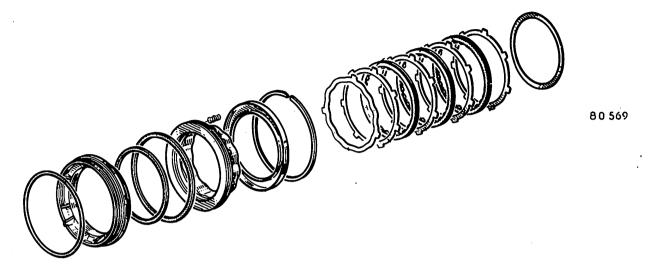






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F2 BRAKE



IN THE MECHANISM CASING

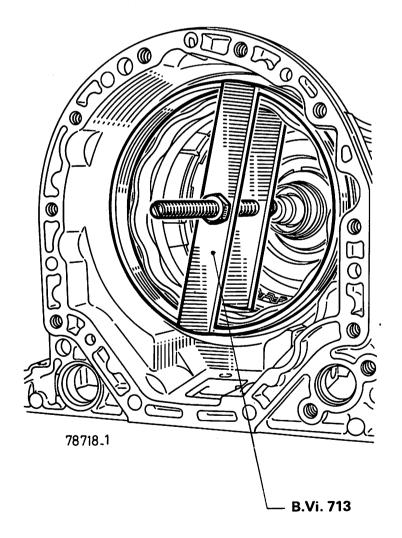
Compress the F2 piston return springs with tool B.Vi.713.

- Remove the cirlip,
- Remove together:
 - tool B.Vi.713,
 - the spring retaining cup,
 - and springs.

Remove the piston.

IN THE FINAL DRIVE CASING

Remove the lined discs, steel discs and adjusting shims (2 shims maximum).

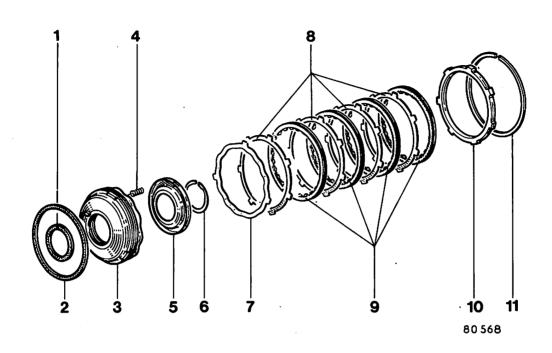




MECHANISM CASING

F1 BRAKE





Remove:

- thrust plate circlip (11),
- thrust plate (10),
- and the steel and lined discs.

Remove:

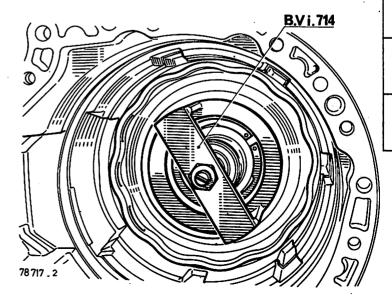
- the El and E2 seal rings,
- needle roller thrust bearing,
- thrust washer,
- and operating clearance setting shims.

Compress the springs with tool B.Vi.714 and remove the circlip.

Remove the tool and retain the thrust cup and springs.

Remove piston (3) by pulling on the spring locating pegs with a pair of pliers.

Remove the piston inner seal (1) and outer seal (2).



Checking components



Mechanism casing:

Make sure that the seal locating surfaces

LINED DISCS

housing.

Change any worn discs or those showing signs of overheating (blackened lining) or breaking up.

on the Fl and F2 pistons are in good

condition, also those in the oil pump

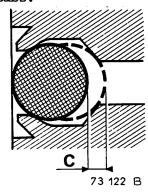
SEALS (Change all removed seals as a matter of course).

OIL SEAL TIGHTNESS

0,2 to 0,7 (.008 to .028") over the diameter.

Change all oil seals which are outside tolerance.

DEPRESSURIZING BALLS (El and E2) The El clutch piston and E2 clutch are fitted with depressurizing balls located by retaining tabs.



Each ball must be absolutely free in its location and must neither stick to its seat nor at the retaining end.

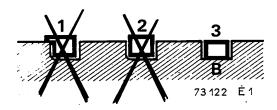
Check ball travel (C) which should be about 1 mm (.040").

Change the complete piston if operation is not satisfactory.

SEALING RINGS

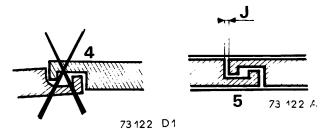
Check:

- amount of wear on seal lands (1),
- condition of ring groove bottoms (2),
- they must be sharp-angled allowing the ring to bottom fully (3),



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- ring gaps (4), They must mate correctly (5).
- gap clearance (J) must measure between 0,5 and 0,35 mm (.002 and .014").



Check the bore opposite the ring locations and and, if worn, change the components, mechanism casing, rings, El - E2 bellhousing, etc.).

El CLUTCH and E2 CLUTCH

Check the piston bore inside and the surface outside.

EPICYCLIC GEAR TRAIN

Check condition of:

- planet wheels,
- sunwheels,
- ring (see E2).
- Pl friction washer in planet wheel carrier.

CLEANING

Do not use trichlorethylene which would damage the oil seals.

Use:

- cotton wool to wipe parts,
- White spirit or a degreaser (except on oil seals).

Blow over the parts with compressed air after cleaning, paying particular attention to all holes, feed channels and oilways.

Lubricate all parts with recommended oil after cleaning.

No liquid other than recommended oil may be used in the converter.

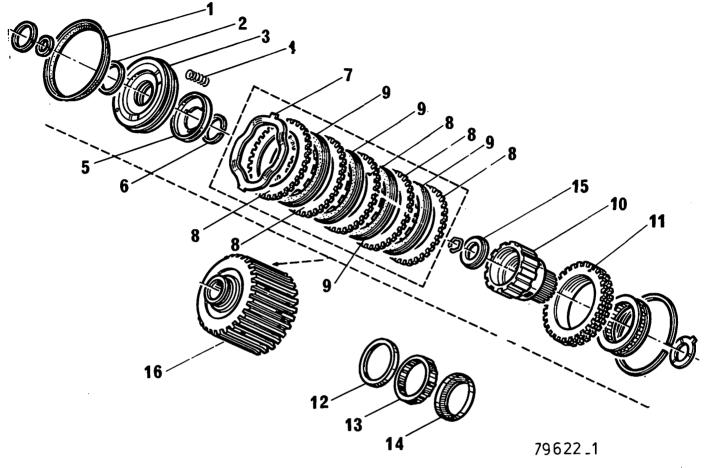
To clean it, allow it to drain for a long period, then use a syringe to pump out the centre of the turbine hub.

Re-assembling

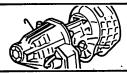


El CLUTCH

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- 1 Piston lip-type seal (outer)
- 2 Square section seal (inner)
- 3 Piston
- 4 Springs
- 5 Spring retaining cup
- 6 Circlip
- 7 Wave-form disc
- 8 Steel discs) Number of discs in stack depends
 -) on automatic transmission suffix.
- 9 Lined discs) Refer to page 258.
- 10 El hub
- 11-Freewheel outer track ring
- 12 Freewheel thrust sleeve
- 13 Freewheel
- 14 Freewheel thrust sleeve
- 15 Needle roller thrust bearing
- 16 Bellhousing

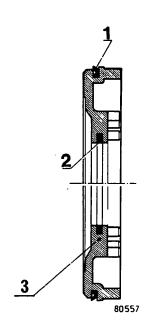




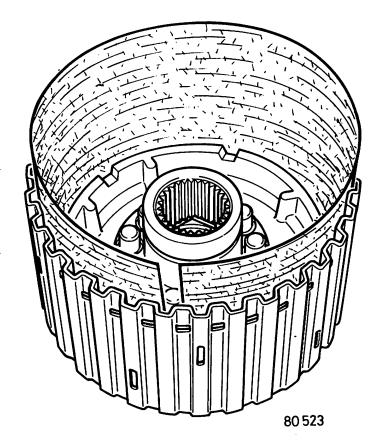
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Lubricate the seals and fit them to piston (3):

- square section seal (2) inside,
- and lip-type seal (1) outside (with lip facing bottom of piston).



Use a strip of thin plastic sheet when inserting piston (3) to prevent the seal lip bending back (a piece of plastic sheet is supplied with each set of seals).



Re-asssembling

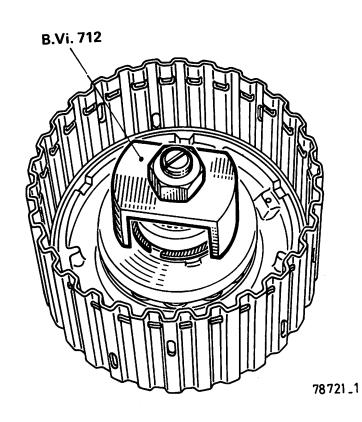


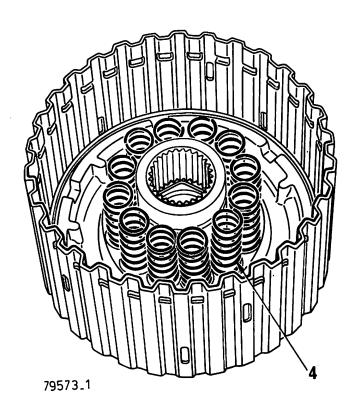
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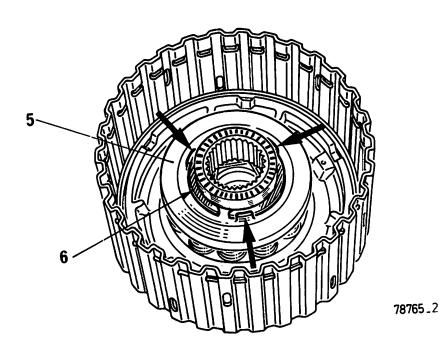
<u>S</u>

Fit all the return springs (4), thrust cup (5) and circlip (6) to the piston.

Compress the springs with tool B.Vi.712 and insert the circlip in its location.







Make sure that the three lugs on the thrust cup are holding the stop ring in position once the tool has been removed.

Re-assembling



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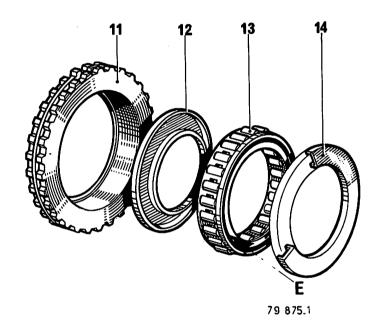
Assemble the following in the housing in the order given:

- the wave-form disc (7),
- 1 steel disc (8),
- 1 lined disc (9),
- 1 steel disc (8) and so on.

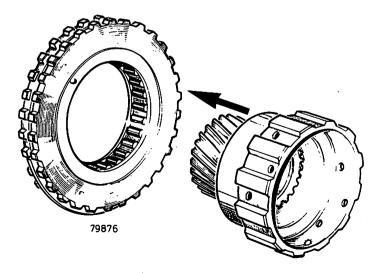
The exact number of discs varies according to the transmission suffix (see page 258).

Assembling the freewheel:

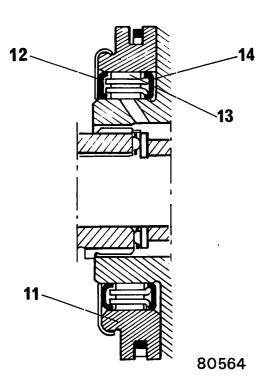
- Assemble the following to freewheel outer track ring (11):
 - . thrust ring (2),
 - . freewheel (13) with shoulder (E) to outside,
 - . and thrust ring (14).



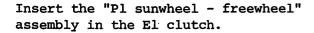
- Fit the above assembly to the El hub.



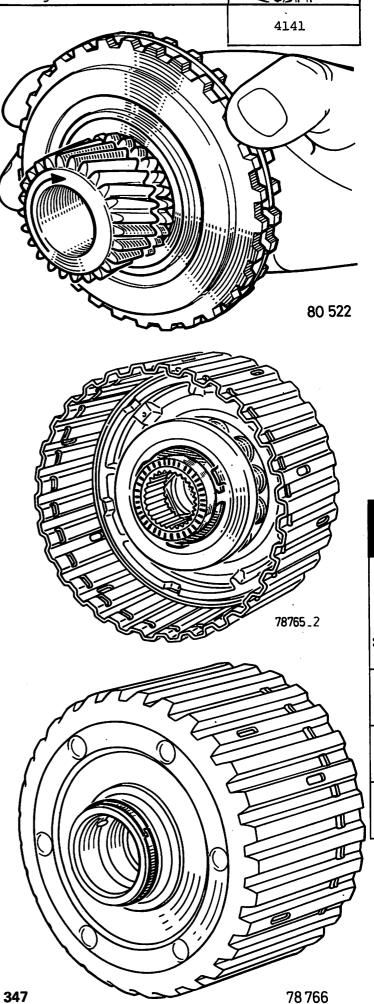
When assembled, hold the freewheel outer track ring stationary; the Pl sunwheel must be free to rotate clockwise and lock itself when an attempt is made to turn it anti-clockwise.



Fit the needle roller thrust bearing in El with the needles facing towards Pl.



Fit the seal ring to the housing.





Re-assembling



E2 CLUTCH

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- 1 Piston lip-type seal (outer)
- 2 Piston
- 3 Lip-type seal on bellhousing hub
- Springs 4
- Spring thrust plate 5
- Circlip 6
- Wave-form disc 7

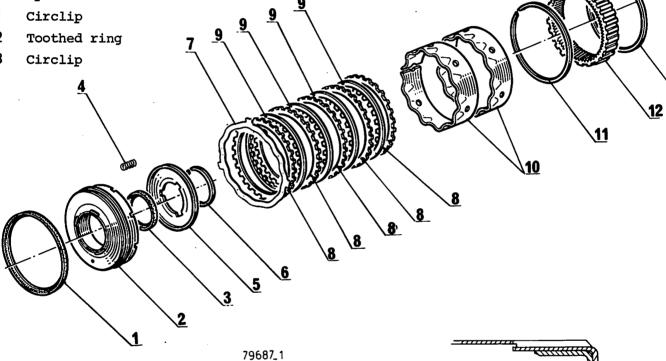
8 Steel discs Number of discs in stack depends on automatic transmission suffix. (Refer to page 258). 9 Lined discs



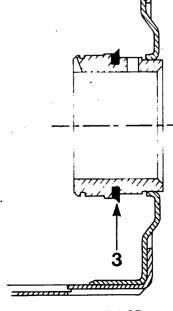
11

12

13



Fit lip-type oil seal (3) to the bellhousing hub (lip facing bottom of bellhousing).





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Lubricate lip-type seal (1) and fit it to piston (2) (with lip facing bottom of piston).

Use a strip of thin plastic sheet when inserting the piston on the bellhousing to prevent damaging the seal lip (a piece of plastic sheet is supplied with each set of seals).

Fit all springs (4), retaining cup (5) and circlip (6) to the piston.

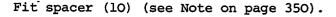
Position tool B.Vi.714 and compress the springs.

Fit circlip (6), making certain that it is fully home in its groove before the tool is removed. Test piston operation with compressed air.

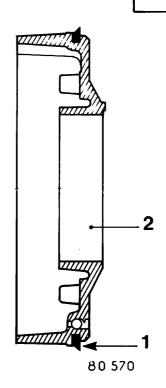
Assemble:

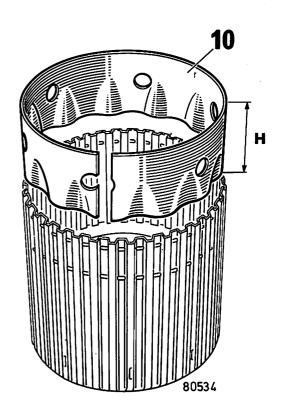
- the wave-form disc (7),
- 1 steel disc (8),
- 1 lined disc (9),
- 1 steel disc (8),

and so on.



Spacer height (H) differs depending on the automatic transmission suffix (see page 258).



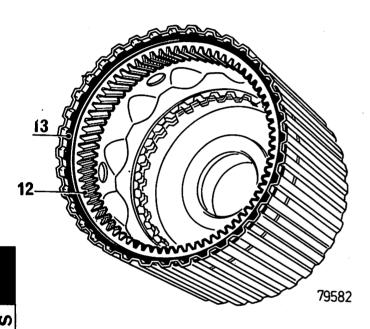


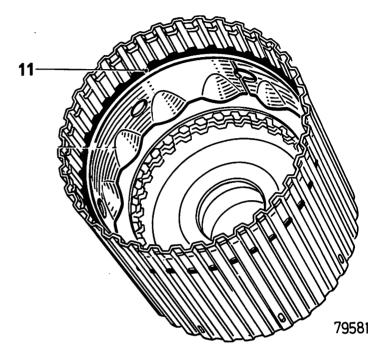


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Fit:

- the circlip (11),
- involute gear (12),
- and circlip (13).





Check the E2 operating clearance using a set of feeler gauges between the spacer and last flat disc.

Note:

The Parts Department supply spacers packed in two's with 1 mm (.040") difference in depth.

If the clearance is incorrect, use the other spacer.

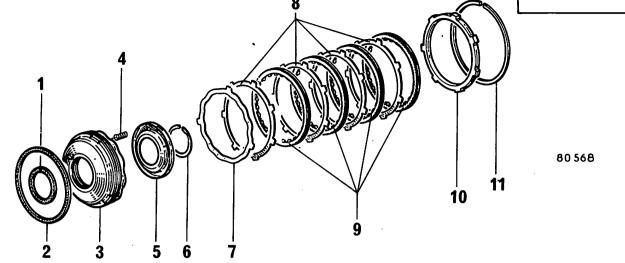
If neither give the correct clearance, check the composition of the stack.

Re-assembling



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F1 BRAKE



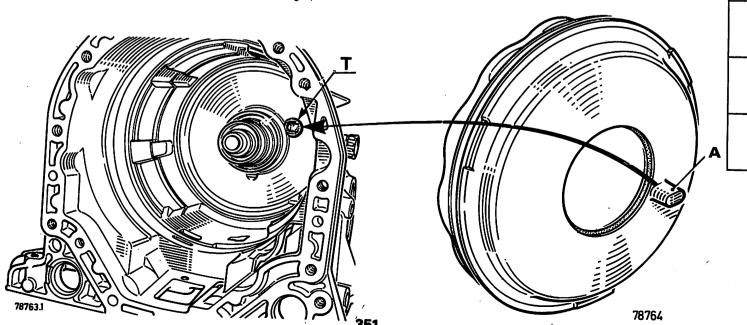
- 1 Square section seal (inside Fl piston)
- 2 Square section seal (outside Fl piston)
- 3 Fl piston
- 4 Springs
- 5 Spring retaining cup
- 6 Circlip
- 7 Wave-form disc

- 8 Steel discs: the number of discs depends on the transmission suffix
- 9 Lined discs: the number of discs depends on the transmission suffix
- 10 Thrust plate: the thickness depends on the transmission suffix
- 11 Circlip

Lubricate square section oil seals (1) and (2) and fit them to Fl piston (3).

Fit the piston using a piece of plastic sheet to help the outer seal to slide (this sheet is supplied with the set of seals).

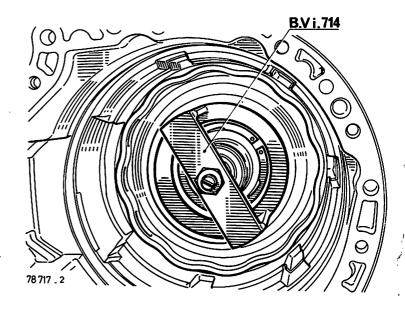
Make sure that boss (A), which locates the piston, enters hole (T) in the casing.



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Fit the springs and thrust plate to the piston and compress the springs with tool B.Vi.714 to insert circlip (pass the tool screw through the circlip before fitting the tool).



Re-assemble:

- the operating clearance adjusting shims,
- needle thrust bearing (needles facing E2),
- and the needle bearing thrust washer.

THE TWO E2 SEAL RINGS WILL NOT BE FITTED UNTIL AFTER THE OPERATING CLEARANCE HAS BEEN ADJUSTED.

Assemble on the piston:

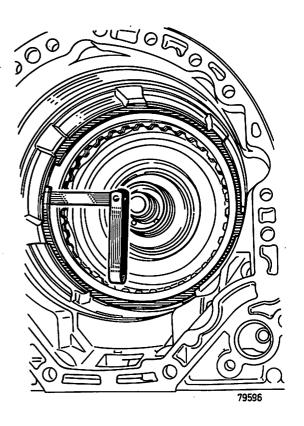
- the wave-form disc (7),
- 1 steel disc (8),
- 1 lined disc (9),
- 1 steel disc (8),

and so on (the number of discs depends on the transmission suffix, see page 258).

- the thrust plate,
- and circlip (11).

Measure the operating clearance to check if the assembly is correct (see table on page 258).

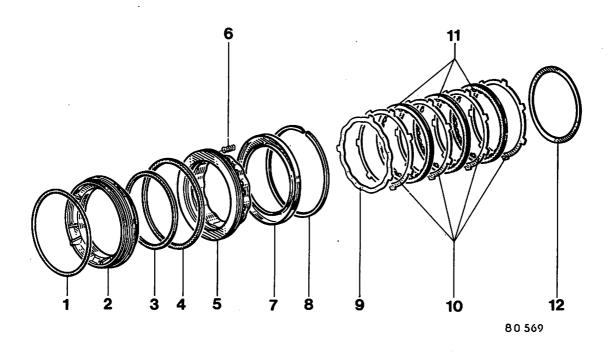
If the clearance is incorrect, recheck the assembly as it cannot be adjusted.





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F2 BRAKE



- 1 Piston carrier outer seal ('O' ring or square section depending on assembly)
- 2 Piston carrier
- 3 Square section seal (inner)
- 4 Square section seal (outer)
- 5 Piston
- 6 Springs

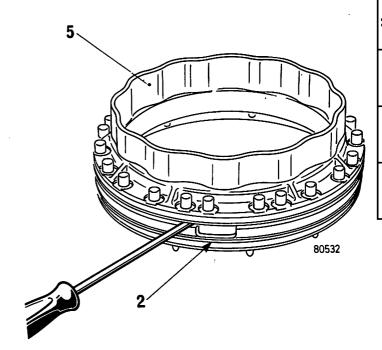
- 7 Spring retaining cup
- 8 Circlip
- 9 Wave-form disc
- 10 Steel discs } Number: see page 258
- 11 Lined discs
- 12 F2 operating clearance adjusting shim

Separate piston (5) from its carrier (2) and change the seals.

If an 'O' ring is fitted (1st assembly), refit an identical 'O' ring in its place.

If the carrier has a square section seal (2nd assembly) refit an identical seal (it is similar to seal (3) fitted inside the piston).

Fit square section seals (3) and (4) to piston (5).

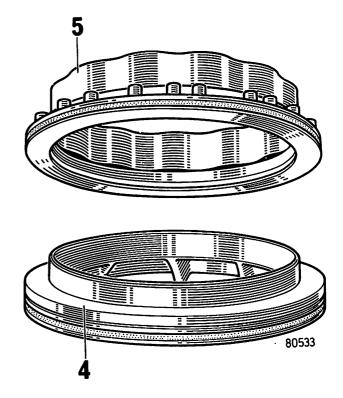






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Lubricate carrier (4) and insert it in piston (5).



Fit the above assembly to the gear casing, making certain that the 3 lugs on the carrier mate with the groove in the casing.

Fit:

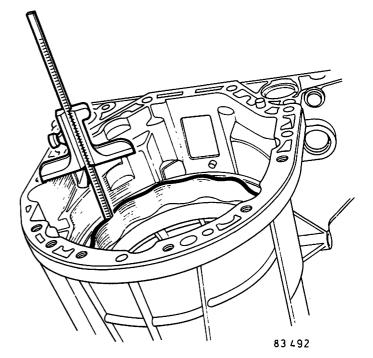
- springs (6) to the piston,
- speing retaining cup (7).

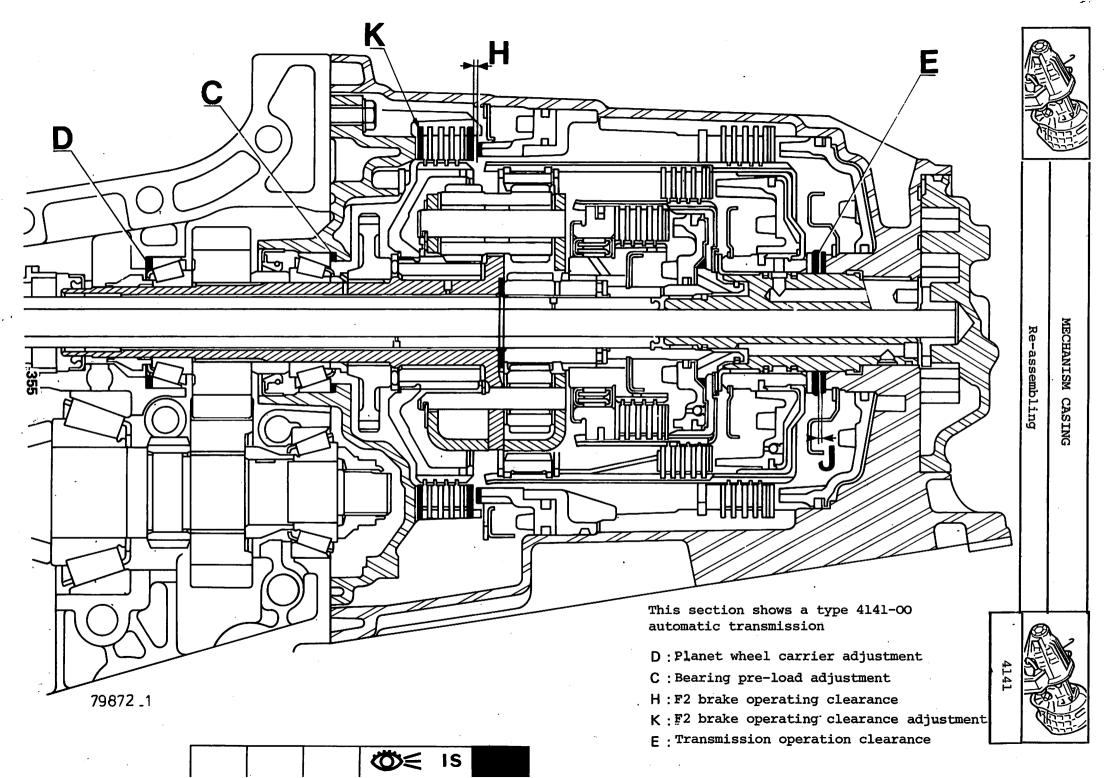
Compress the springs using tool B.Vi.713.

Fit circlip (8).

Remove tool B.Vi.713.

Make certain that the F2 piston is fully home. Measure at three points round with a depth rule; the values should be equal.









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CHECKING AND ADJUSTING THE F2 OPERATING CLEARANCE

There must be a clearance (H) between the F2 piston in the mechanism casing and the last F2 disc in the planet wheel carrier to allow the F2 brake to function correctly.



1 - Measuring dimension (Al) on the final
 drive casing

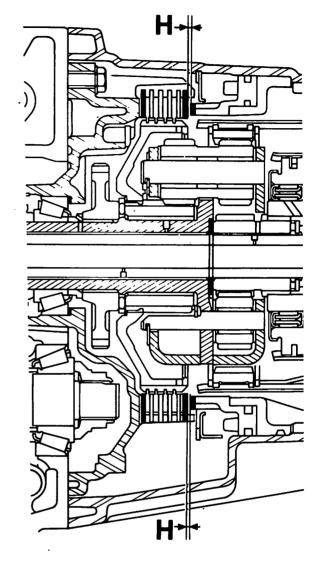
Fit the paper gasket to the final drive casing, position tool B.Vi.715 and measure dimension (Y) between the top face of the tool and the last F2 disc.

(Change the wave-form disc for a plain disc to obtain an exact measurement).

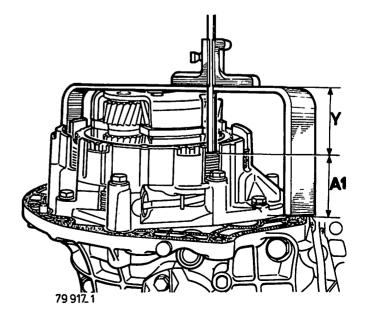
Subtract dimension (Y) from the total tool height (120 mm = 4.724") to obtain dimension (Al).

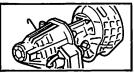
Dimension (A1) = 120 mm (4.724") - (Y).

Remember to return the wave-form disc to its correct position in the stack after the measurement has been taken.

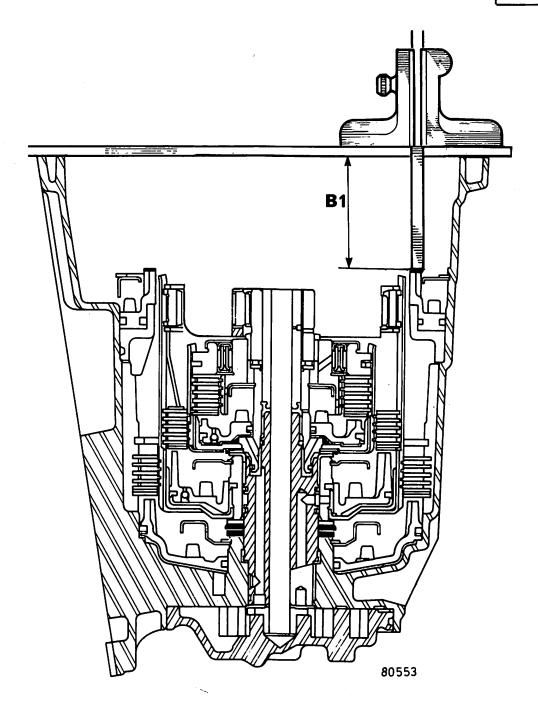


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2 - Measuring dimension (B1) on the mechanism casing

Measure dimension (B1) between the piston and mechanism casing joint face with a ruler and depth rule (dimension B1 = dimension as read less thickness of depth rule).

Calculate the difference between dimensions (A1) and (B1) (H = B1 - A1) and fit shims under the discs to obtain the correct operating clearance. (Refer to page 258).



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The transmission operating clearance is the endplay existing in the mechanism casing.

This endplay (J) exists at (E) and is obtained by measuring dimensions (A2) and (B2) and calculating the difference. The above measurements are taken in two stages.

 Measuring dimension (A2) on the final drive casing

Position tool B.Vi.715 on the final drive casing and measure dimension (X) between the top face of tool and the planet wheel carrier shaft (without the gasket).

REMEMBER TO REMOVE THE FRICTION WASHER.

Calculate the difference between the tool dimension (120 mm = 4.724") and dimension (X) to find dimension (A2).

possible to 73,6 mm (2.898").

Dimension (A2) should be as near as

A shim (C) 0,2 mm (.0079") thick must therefore be fitted to obtain this dimension:

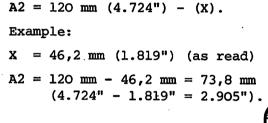
73.8 mm - 73.6 mm = 0.2 mm (2.905" - 2.898" = .007").

Shim (D) must be increased by the same amount as shim (C) in order to retain the correct bearing preload.

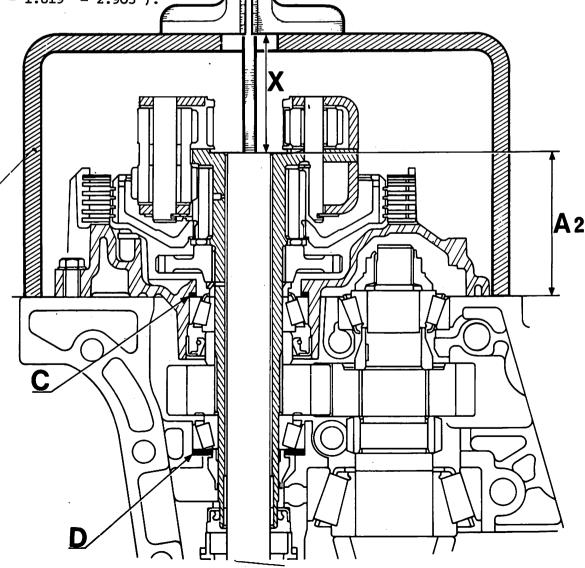
In the above example, a shim 0,2 mm (.0079") thick must be removed from (D).

C = Planet wheel carrier adjustment.

D = Bearing preload adjustment.





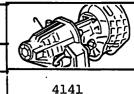


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MECHANISM CASING

Re-assembling



2 - Measuring dimension (B2) in the mechanism casing

Place the following in the casing:

- E2 clutch,
- El clutch,
- the friction washer between the planet wheel carrier shaft and the Pl hub on the hub.

Measure dimension (B2) between the paper gasket and hub washer with a straight edge and depth rule (deduct thickness of straight edge).

Example:

- Value is read: 79,8 mm (3.141")
- Thickness of straight edge: 5,2 mm (.204")

$$B2 = 79.8 \text{ mm} - 5.2 \text{ mm} = 74.6 \text{ mm}$$

(3.141" - .204" = 2.937")

Clearance J is equal to:

$$J = B2 - A2$$

$$J = 74.6 \text{ mm} - 73.6 \text{ mm} = 1 \text{ mm}$$

(2.937" - 2.897" = .040")

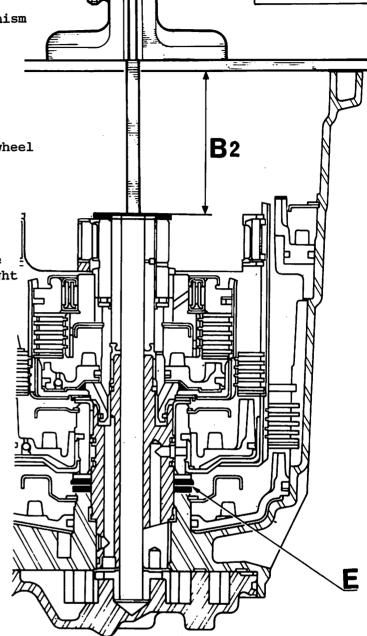
Clearance (J) must be between 0.27 and 0.74 mm.

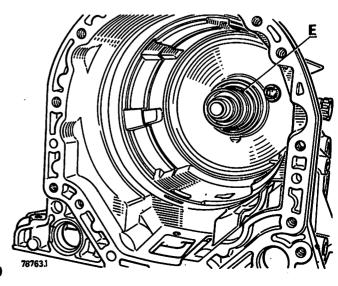
In the above example, which has a clearance of 1 mm (.040"), a shim 0,5 mm (.020") thick must be inserted at E to keep within tolerance.

Shims are available in the following thicknesses:

Check and refit:

- The needle roller thrust bearing (needles uppermost),
- thrust washer,
- and the 2 E2 seal rings.





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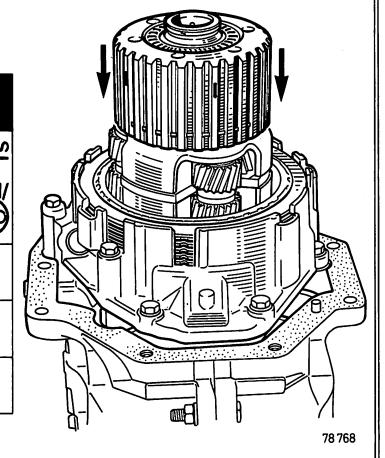
ASSEMBLING THE FINAL DRIVE AND MECHANISM CASINGS

Place the final drive casing in a vertical position.

Position: the friction washer on the planet wheel carrier shaft (grooves facing planet wheel carrier shaft): the seal between the final drive casing and mechanism casing.

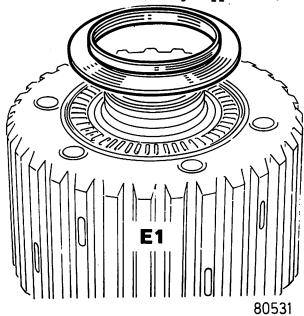
Make certain that all the F2 discs are stacked correctly.

Fit the El clutch with its turbine shaft.



Fit the following to El:

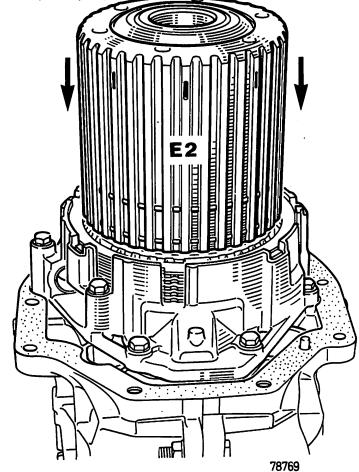
- needle thrust bearing (needles uppermost),
- and thrust washer (flange uppermost).



Fit the E2 clutch followed by the mechanism casing.

(Align the Fl disc splines to make it easier to fit the casing).

Fit the bolts and torque tighten them to between 1,8 and 2,2 m.da N (13 1/2 to 16 1/2 lb/ft).

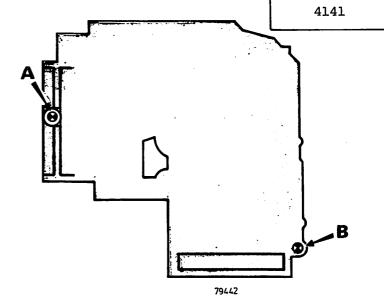


HYDRAULIC DISTRIBUTOR

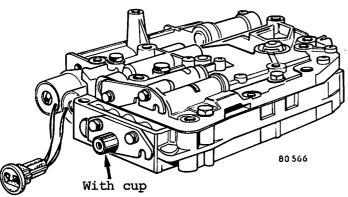
It is essential to fit the new paper gaskets and new plate supplied with the new distributor.

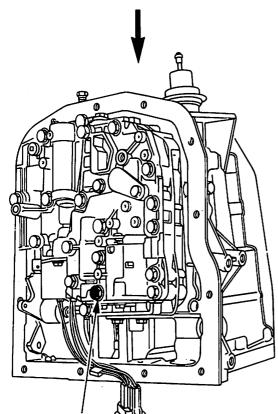
Centralize the distributor and paper gaskets at (A) and (B) with M7 125 \times 60 bolts, cutting off the heads and sawing slots for a screwdriver.

Torque tighten the bolts in the correct sequence:

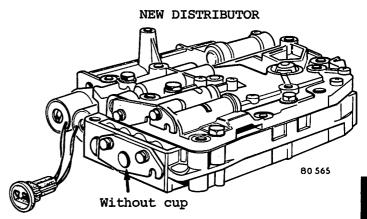


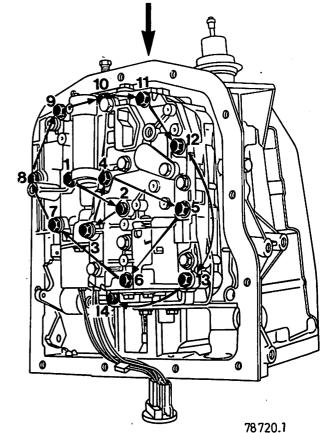
OLD DISTRIBUTOR





O,7 m.da N (5 1/4 lb/ft)
Other bolts to 1 m.da N (7 1/2 lb/ft)
and tightened in sequence.





MECHANISM CASING



Re-assembling



Refit the "Park" locking finger and clip (1).

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Refit the manual valve and its control (2) to the hydraulic distributor.

Refit the multiple switch and gasket.

Refit the cables and sealed socket.

Connect the solenoid ball valve wires.

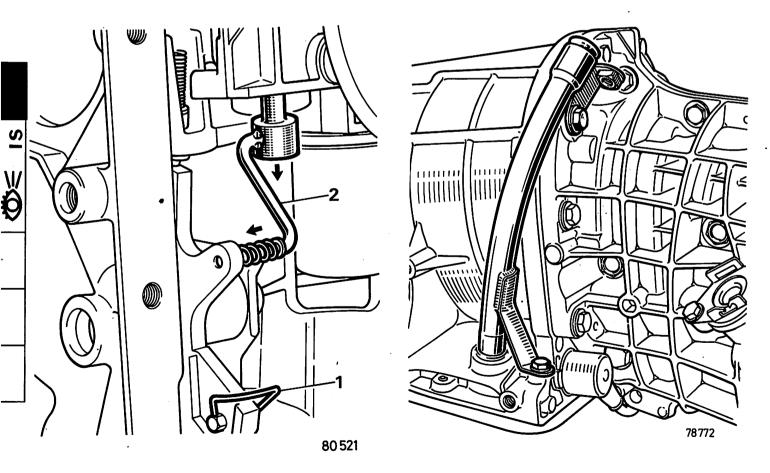
Refit the sump with a new gasket and torque tighten the bolts.

Refit the dipstick tube and washer.

Refit the following to the pump housing:

- the large gear (chamfer facing pump housing),
- small gear,
- and drive.

Fit the round seal to the pump housing before offering up the pump to the mechanism casing.



IF THE OLD PUMP IS REFITTED, FOLLOW THE MARKS MADE ON DISMANTLING.





Code **2273**

Dismantling - Re-assembling

Methods reference	Description	Useful	Essential	Specifically for vehicle
B. Vi. 806	Final drive pinion locking tool		Ö	
T. Ar. 65	Bearing extractor		_	
B. Tr. 02	Clamp for T.Ar.65			
B. Vi. 16-01	Transmission support			
B. Vi. 645	Differential ring nut wrench			
B. Vi. 805	Differential ring nut wrench - use with B.Vi.645			
B. Vi. 722	Bearing preload checking pulley		_	
B. Vi. 715	Transmission operating clearance checking tool			

TIGHTENING TORQUES

Output shaft (planet wheel carrier) nut	18 to	20 m.da N	(135 to 150 lb/ft)
Crown wheel fixing bolts	12 to	14 m.da N	(90 to 105 lb/ft)
Half-casing assembly bolts 8 mm dia.		3 m.da N	(22½ lb/ft)
Half-casing assembly bolts 10 mm dia.	4 to	4,5 m.da N	(30 to 34 lb/ft)
Final drive pinion nut	22 to	24 m.da N	(165 to 180 lb/ft)
F2 brake bolts		1,5 m.da N	(11 lb/ft)

The following must be removed before the final drive casing may be overhauled:

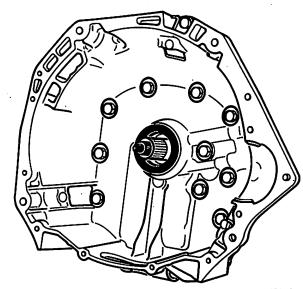
- mechanism casing,
- and converter casing.

After removing the mechanism casing, withdraw:

- the E2 clutch,
- El clutch,
- and F2 brake discs.

Remove:

- the converter casing bolts and take off the converter.





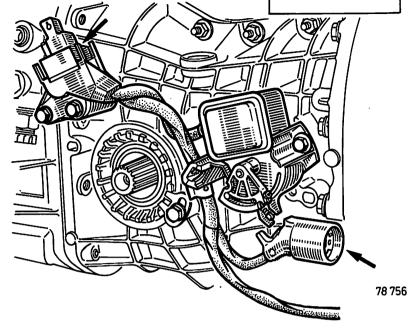




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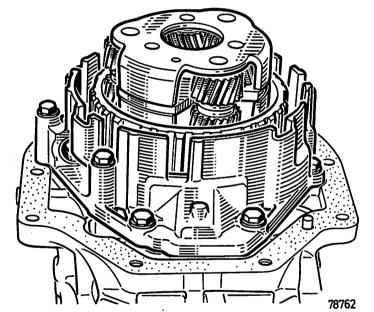
- the bolts holding the governorcomputer,
- and the bolts holding the connectors.

Remove the assembly.



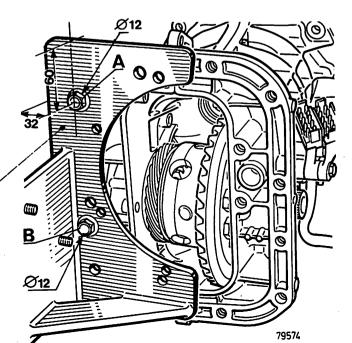
Remove the output shaft bellhousing bolts and take out the assembly.

Remove the gasket.



Attach the final drive casing to support B.Vi.16-Ol after drilling hole (A) to the dimensions given in the sketch and enlarging hole (B).

B. Vi. 16-01-



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FINAL DRIVE ASSEMBLY

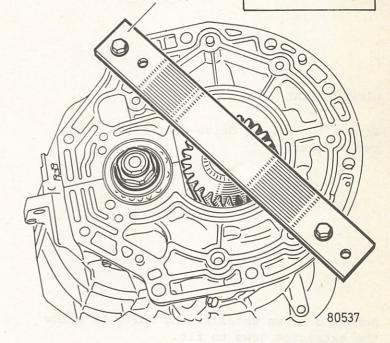
Dismantling



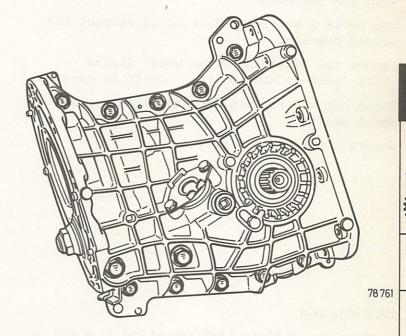
B. Vi. 806

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Fit tool B.Vi.806, unlock the final drive pinion nut and unscrew it.

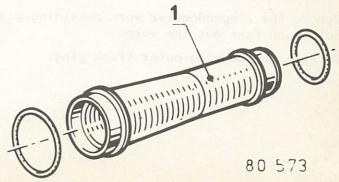


Remove the half-casing assembly bolts.



Separate the half-casings and take out:

- the differential,
- spacer sleeve (1),
- and final drive pinion.

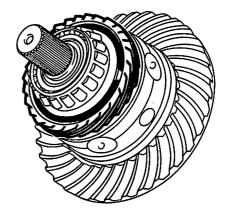




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DIFFERENTIAL

Remove the speedo drive gear circlip and remove gear.



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Remove 3 crown wheel fixing bolts to allow the extractor jaws to fit.

Remove the sunwheel 'O' rings.

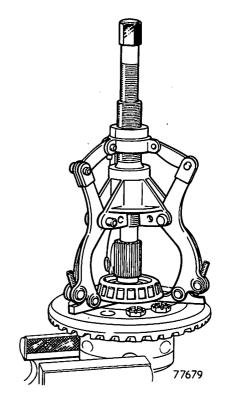
Extract the bearing at the crown wheel end with a 3-jaw puller.

Use tools T.Av.65 and B.Tr.02 to extract the second bearing.

Remove the remaining crown wheel fixing bolts (self-locking bolts - not to be re-used).

Punch out the rollpin from the longer planet wheel shaft.

Separate the various parts.



HALF-CASINGS

Unscrew the differential adjusting ring nut on the R.H. half-casing after removing the locktab Remove the oil seal.

Remove the 2 speedometer worm retaining plate bolts and take out the worm.

Extract the bearing outer track ring.

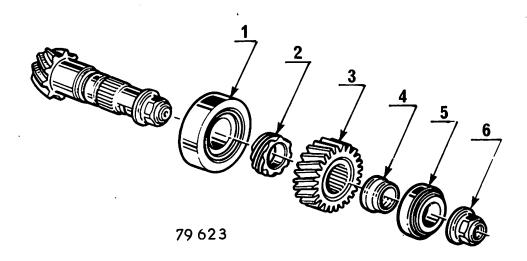




FINAL DRIVE PINION



2



- 1 Bearing
- 2 Governor drive gear
- 3 Stepdown gear (25 teeth diameter may vary depending on ratio)
- 4 Pre-load adjusting sleeve
- 5 Bearing
- 6 Nut

DISMANTLING

Remove:

- nut (6),
- bearing (5),
- pre-load adjusting sleeve (4),
- stepdown gear (3),
- governor drive gear (2),
- and the bearing under the final drive pinion using the WILMONDA tool (Ref. TOY.A) and a press.

RE-ASSEMBLING

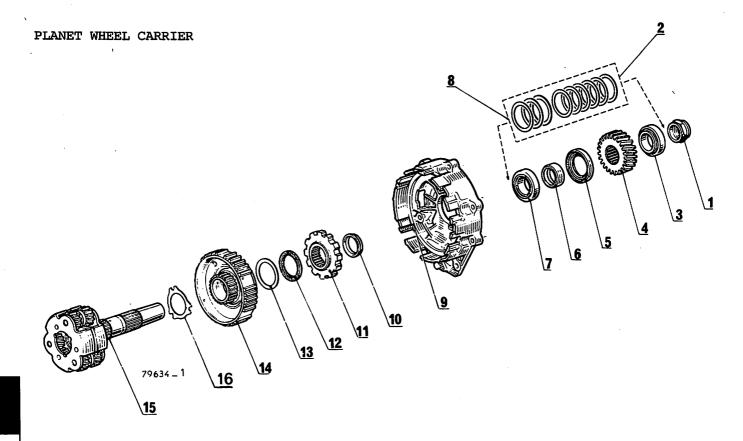
Fit the following to the final drive pinion in this order:

- bearing (1) under head using a press and length of suitable tube,
- governor drive gear (2),
- stepdown gear (3) (flat face towards final drive pinion head),
- pre-load adjusting sleeve (4) removed on dismantling (taper facing nut end).
- outer track ring,
- and bearing.

Screw a new nut (6) on the final drive pinion.

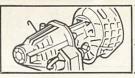
Do not torque tighten the nut until after the half-casings have been assembled.

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- 2 Sunwheel carrier adjusting shim
- 3 Bearing
- 4 Stepdown gear
- 5 Lip-type oil seal
- 6 Distance sleeve
- 7 Bearing
- 8 Bearing pre-load adjusting shim
- 9 F2 bellhousing
- 10 Distance sleeve
- 11 "Park" sprocket
- 12 Needle roller thrust bearing
- 13 Needle roller bearing
- 14 F2 hub
- 15 Sunwheel carrier shaft
- 16 Sunwheel reaction thrust washer





Remove the following from the shaft:

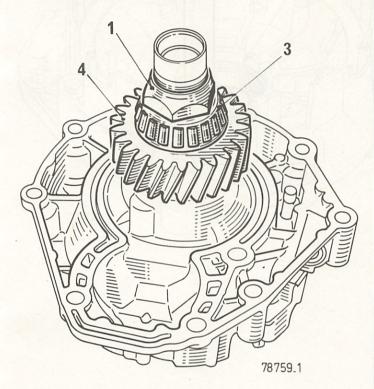
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Hold the output shaft stationary with the stepdown gear.

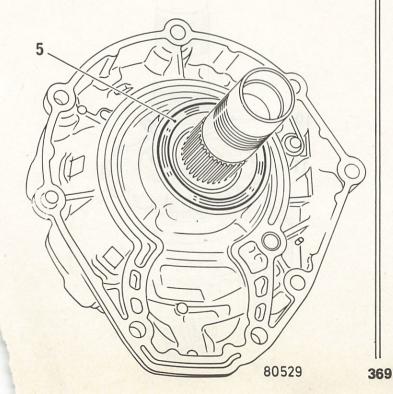
Unlock and unscrew nut (1) on the end of the shaft.

Remove:

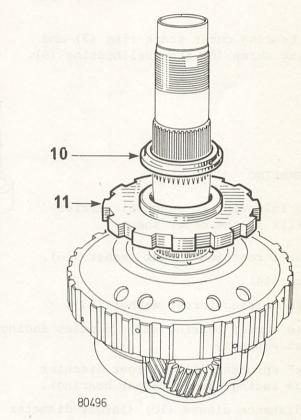
- bearing (3),
- stepdown gear (4),
- and spacer sleeve (6).



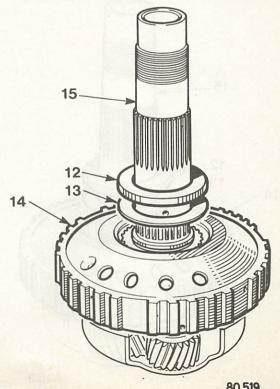
Remove the output shaft, bearing and seal (5) from bellhousing (9).

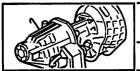


- distance sleeve (10),
- "Park" sprocket (11),



- thrust (12),
- thrust washer (13),
- F2 hub (14),
- and sunwheel reaction thrust washer (16).





FINAL DRIVE ASSEMBLY

Dismantling



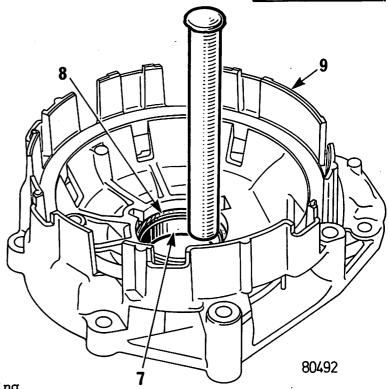
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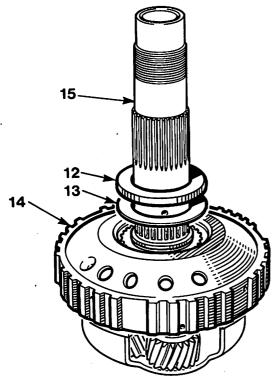
Remove bearing outer track ring (7) and adjusting shims (8) from bellhousing (9).

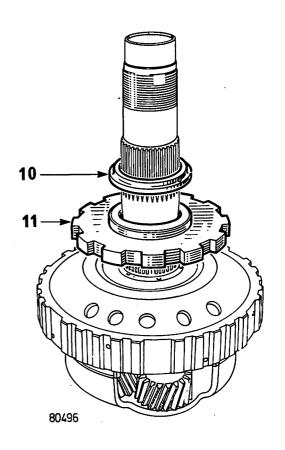
RE-ASSEMBLING

Fit the following to sunwheel carrier shaft (15) in the order shown:

- sunwheel reaction thrust washer (16),
- F2 hub (14),
- needle bearing thrust washer (13),
- needle thrust bearing (12) (needles facing thrust washer),
- "Park" sprocket (11) (larger diameter flange facing needle thrust bearing),
- and distance sleeve (10) (larger diameter facing "Park" sprocket).



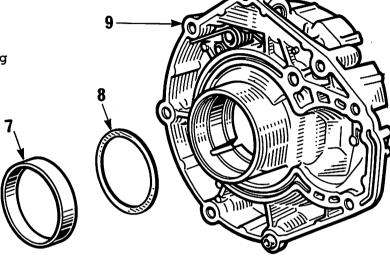






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Fit adjusting shims (8) and bearing outer track ring (7) to F2 brake housing (9).



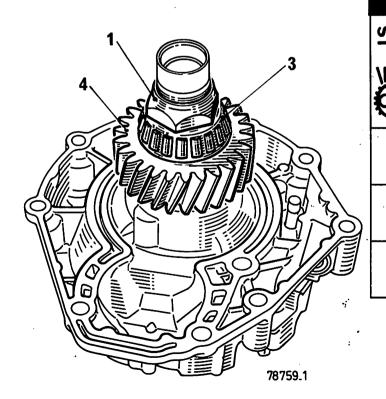
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Adjustments must be carried out before a new oil seal is fitted. Pass the planet wheel carrier shaft through the brake housing before fitting the following:

- bearing (7),
- seal retaining sleeve (6),
- stepdown driving gear (4) (groove facing nut),
- and second bearing (3).

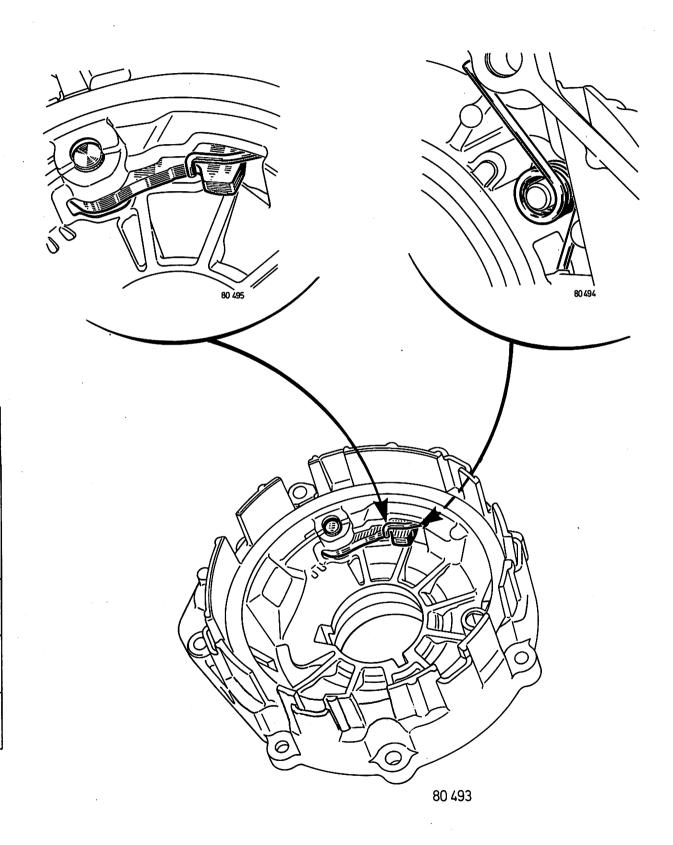
Fit a new nut (1) on the end of the shaft and torque tighten it.

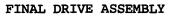
Do not lock nut at this stage.



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Fitting the "Park" finger spring



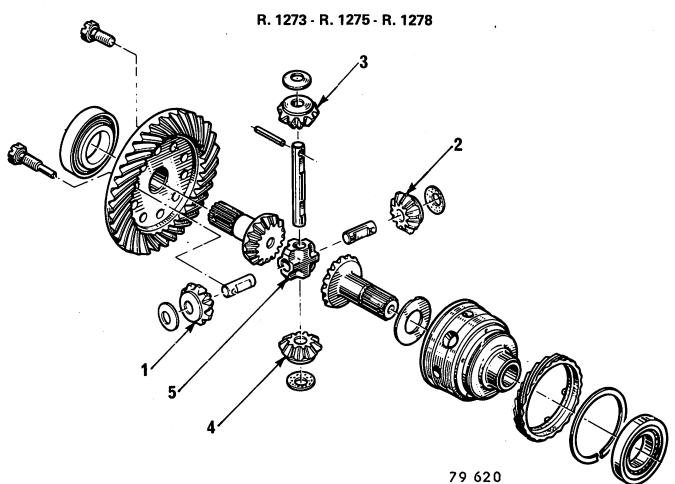




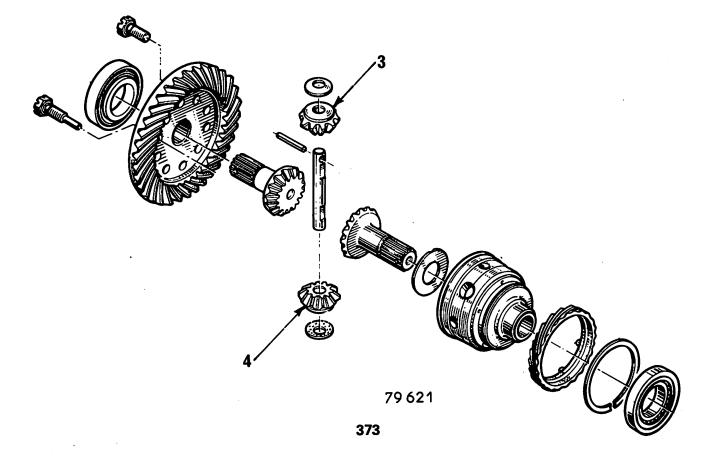
DIFFERENTIAL



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R./1271 - R. 1272



FINAL DRIVE ASSEMBLY



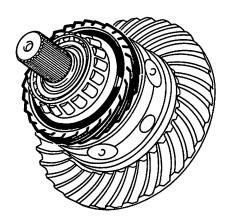
Re-assembling



4141

Place the following in the housing:

- the bakelite impregnated washer, lubricating groove facing sunwheel: use the washer 1,96 to 2 mm (.077 to .079") thick. The washer 2,3 mm (.090") thick will only be used when there is excess play between the sunwheel and planet wheel gear teeth.
- one sunwheel dipped in recommended oil.



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- and depending on the type of automatic transmission:
 - . planet wheels (1 and 2) and their thrust washers; push the shaft in so that they do not protrude from the planet wheels.
 - . planet wheels (3 and 4) and their thrust washers; push the shaft in so that it does not protrude from planet wheel (3).
 - . across (5). (The cross is rectangular and must be fitted so that the longer side matches the long shaft).
- push all 3 shafts fully home in the housing so that their holes match those in the housing.
- rollpin the long shaft.

Dip the second sunwheel in recommended oil and insert in the housing.

Fit the crown wheel to the housing with new self-locking bolts: the bolts with spigot ends hold the short shafts.

Torque tighten the crown wheel fixing bolts.

The differential assembly may be slightly hard to turn after assembly.

Press in both bearings.

Fit '0' rings to the sunwheels.

Fit the speedometer drive gear and circlip.



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HALF-HOUSINGS

Fit the speedometer driven worm in the R.H. half-casing and fasten the retaining plate.

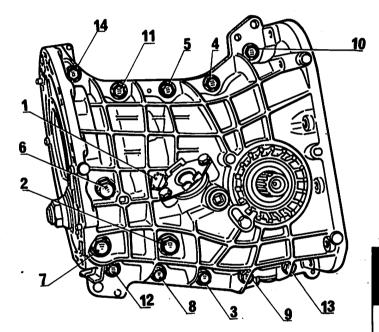
Fit the bearing outer track rings to match the bearing in the half-casings so that they are slightly recessed in relation to the inside face of the housings.

Use wrench B.Vi.645 or B.Vi.805 to screw up the ring nuts until they contact the bearing outer track rings.

ADJUSTING THE FINAL DRIVE PINION PRE-LOAD

Fit the final drive pinion and assemble the half-housings together.

Fit all the assembly bolts and tighten them to the recommended torque.



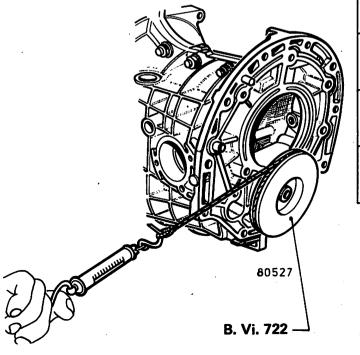
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Rotate the final drive pinion several times to settle the bearings.

Use tool B.Vi.806 to tighten the final drive pinion nut.

Torque tighten the nut.

Do not lock the nut at this stage.







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RE-USED BEARINGS

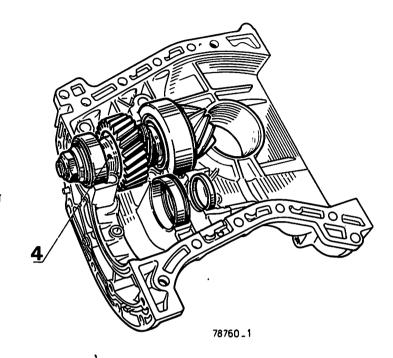
The final drive pinion must turn freely without play.

NEW BEARINGS

Fit pulley B.Vi.722 to the final drive pinion nut and measure the pre-load with a spring balance: 2 to 3,5 da N (4 1/2 to 7 lbs/). Adjust by increasing or reducing the thickness of sleeve (4).

Loosen the nut using tool B.Vi.806 after adjusting bearing pre-load,

Open the half-casings and remove the final drive pinion.



ADJUSTING THE PLANET WHEEL CARRIER AND THE DIFFERENTIAL AND PLANET WHEEL CARRIER BEARING PRE-LOADS

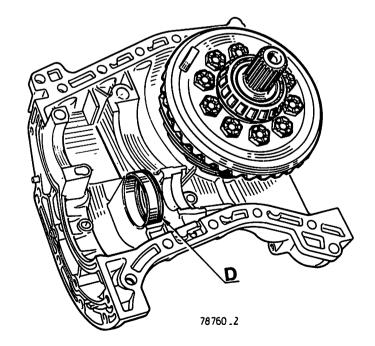
Adjustments to be carried out on the planet wheel carrier are as follows:

- planet wheel carrier operating clearance,
- bearing pre-load.

It is advisable to keep to the above order.

Fit the bearing outer track ring, the adjusting shims (D) (planet wheel carrier adjustment) removed on dismantling and the differential in one of the half-casings.

Fit all the casing bolts and torque tighten them in the correct sequence.



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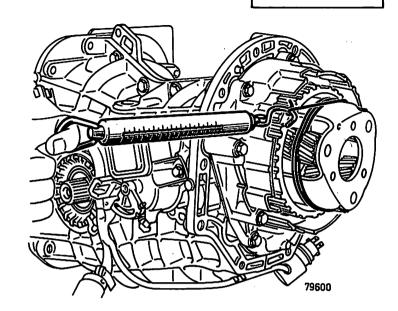


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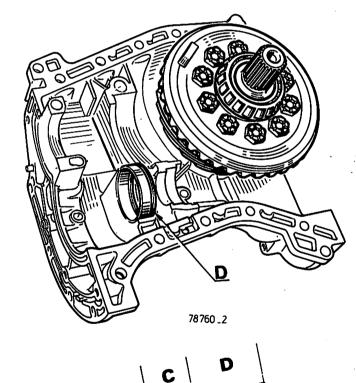
BEARING PRE-LOAD

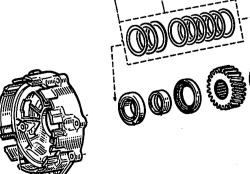
Rotate the planet wheel carrier shaft to settle the bearings.

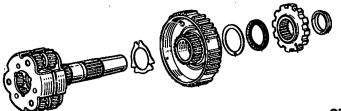
- re-used bearings: the shaft should turn freely and without play,
- new bearings: measure pre-load with a spring balance and a piece of cord. It should be between 0,5 and 1,2 da N (1 and 3 lbs).



Pre-load adjustment is made by increasing or reducing the thickness of shims (D) at the nut end. When these two adjustments have been made, fit the lip-type oil seal in the F2 brake housing, torque tighten the nut on the end of the shaft to 20 m.da N (150 lb/ft) and lock it.









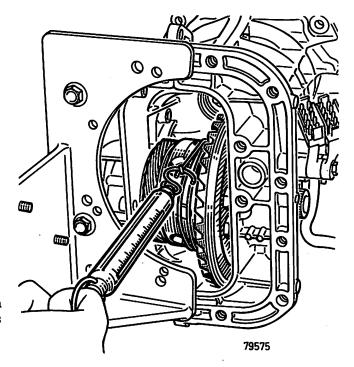
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ADJUSTING DIFFERENTIAL BEARINGS

When making the adjustment, screw up the ring nut at the differential housing end to obtain slightly more backlash than normal.

- Re-used bearings:
 Screw up the ring nuts gradually, turning the differential at the same time, to obtain free turning without play.
- New bearings:
 Screw up the ring nuts until the
 differential is slightly hard to turn.
 Check bearing pre-load with a spring
 balance and piece of cord: 1 to 3 da N
 (2 1/4 to 6 1/2 lbs).

Mark the position of the ring nuts in relation to the half-casings when the final setting has been obtained.



Once all the adjustments have been made, open the final drive casing and fit the final drive pinion in the half-casing.

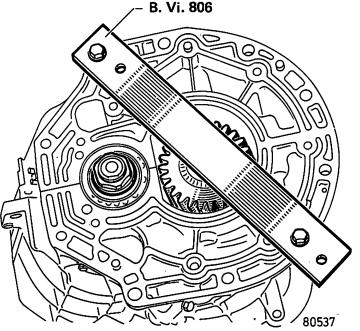
Smear "Curtylon" paste on all casing joint faces and assemble the casings.

Torque tighten the assembly bolts.

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Fit tool B.Vi.806 and torque tighten the final drive pinion nut.

Fit the planet wheel carrier shaft with its seal and attach the F2 brake housing.



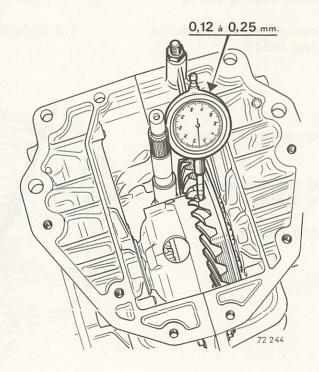


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ADJUSTING BACKLASH

Feel the amount of backlash present by hand. If it is excessive, turn the ring nuts to reduce.

When the ring nut on the crown wheel side is screwed in, the ring nut on the differential housing side must be unscrewed by the same amount in order to retain the degree of bearing pre-load adjusted previously.



Attach a clock gauge to one of the half-casings at right angles to a tooth flank as close as possible to the outer edge of the crown wheel. Check backlash: 0,12 to 0,25 mm (.005 to .010").

If excessive, screw in the ring nut on the crown wheel side and unscrew the ring nut on the differential housing side by the same amount.

If insufficient, reverse the process.

Lock the ring nuts with locktabs after the correct backlash has been obtained.



CONVERTER CASING

Dismantling - Re-assembling



SPECIAL TOOLS

4141

Methods Reference	. Description	Useful	Essential	Specifically for vehicle
B. Vi. 716	Output shaft oil seal inserting tool			
B. Vi. 465	Converter oil seal inserting tool			

TIGHTENING TORQUES

Stator support fixing bolts 3 to 3,5 m.da N $(22\frac{1}{2}$ to 26 lb/ft)

Converter casing to final drive casing fixing bolts

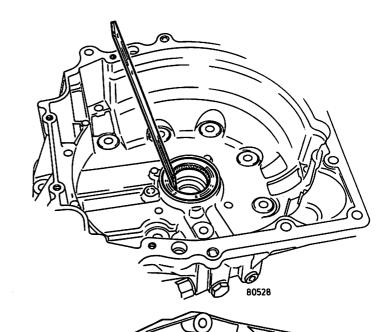
4,5 m.da N (30 to 34 lb/ft)

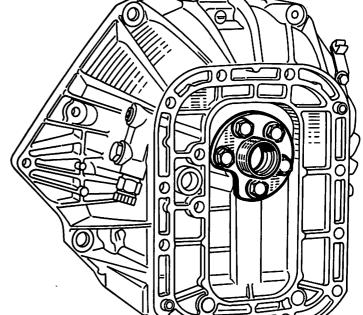
DISMANTLING

The automatic transmission must be removed for this operation.

Remove the bolts securing the converter casing to the final drive casing.

Remove the oil seal, taking care not to burr the housing.





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Remove the stator shaft and seal.





CONVERTER CASING

Dismantling - Re-assembling



SPECIAL TOOLS

4141

Methods Reference	Description	Useful	Essential	Specifically for vehicle
B. Vi. 716	Output shaft oil seal inserting tool	no den on		
B. Vi. 465	Converter oil seal inserting tool	tain sub ed dige e	nt teleston	

TIGHTENING TORQUES

Converter casing to final drive casing fixing bolts

Stator support fixing bolts 3 to 3,5 m.da N $(22\frac{1}{2}$ to 26 lb/ft)

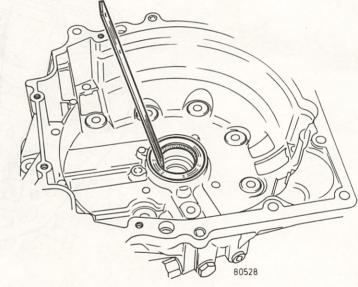
4,5 m.da N (30 to 34 lb/ft)

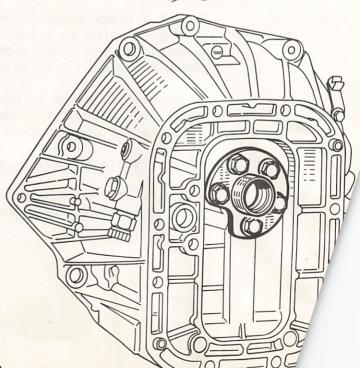
DISMANTLING

The automatic transmission must be removed for this operation.

Remove the bolts securing the converter casing to the final drive casing.

Remove the oil seal, taking care not to burr the housing.





Remove the stator shaft and seal.





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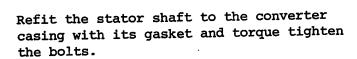
Remove the distance tube and seal in the final drive casing.

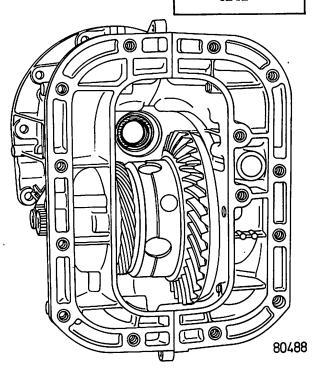


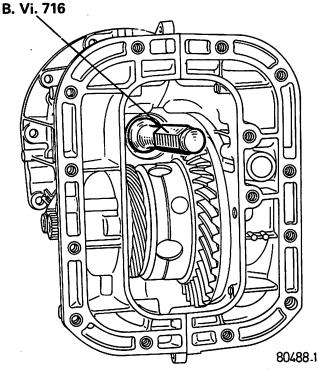
Use tool B.Vi.716 to fit the oil seal to the final drive casing.

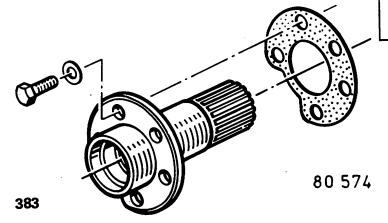
Make sure that the oil seal is fully home.

(ONLY FIT THIS OIL SEAL AFTER THE CASING HAS BEEN ASSEMBLED).





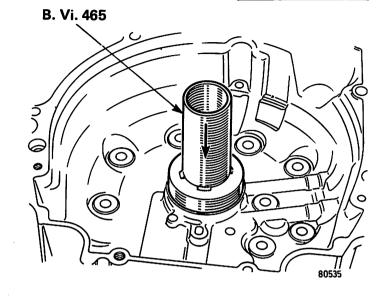






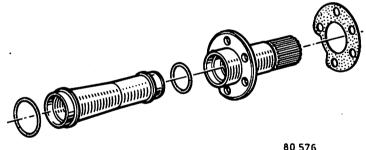
4141

Insert the oil seal into the converter casing using tool B.Vi.465.



Fit the distance sleeve with its 2 seals:

- 1 seal in the stator shaft,
- and 1 seal in the final drive casing.



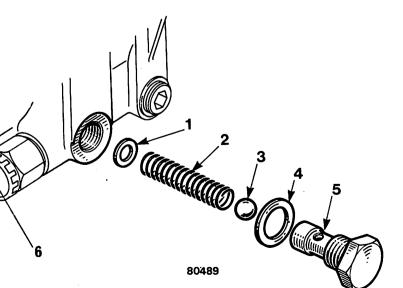
80 576

Fit the converter casing with its gasket (dry) then torque tighten the bolts.

If the valve (converter return safety device) in the converter casing has been dismantled, re-assemble it as follows:

- washer (1),
- spring (2),
- ball (3),
- valve (5) with seal (4).

(Plug (6) enables ball (3) to be taken out).





Code 9536



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R. 1271

One single fitting kit available from Parts Department is suitable for both L.H.D. and R.H.D. and for vehicles with either the 360 mm (14") or 440 mm (17 1/4") radiator.

An oil cooler may be fitted to a vehicle provided that it has no air conditioning system.

THE OIL IN THE FINAL DRIVE CASING MUST BE CHANGED WHEN AN OIL COOLER IS FITTED.

FITTING INSTRUCTIONS

Place the vehicle on a lift

ENGINE COOLING RADIATOR ON L.H. SIDE (up to and including 1977 model).

a - Cutting out the front end panel cardboard

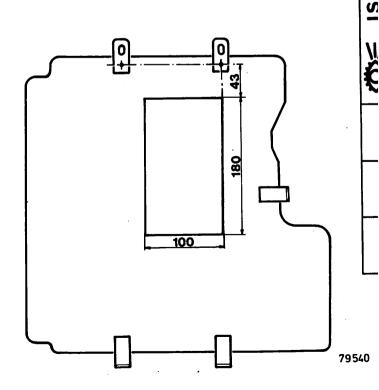
Cut a rectangle in the cardboard following the dimensions given in the drawing.

The cardboard is fixed to the front end panel in one of two ways:

- either by clips,
- or by blind rivets.

In the case of the former, the cardboard will be easier to cut if it is removed first.

In the latter, it can be cut out in situ.





R. 1271



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b - Installing the oil cooler

(up to and including the 1977 model)

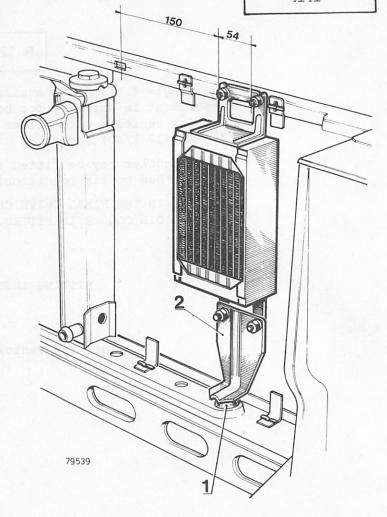
Drill 2 \times 7 mm dia. holes in the top crossmember at the centres given on the right.

Use hole (1) on the front end panel crossmember to locate the mounting pad.

Screw bottom bracket (2) onto the oil cooler.

Insert the bottom bracket into the mounting pad and fix the oil cooler at the top.

(It may be necessary to remove one or two rivets along the top of the cardboard to insert the bolts, depending on the method used to hold the cardboard).



ENGINE COOLING RADIATOR ON R.H. SIDE (1978 model onwards)

a - Cutting out the front end panel cardboard

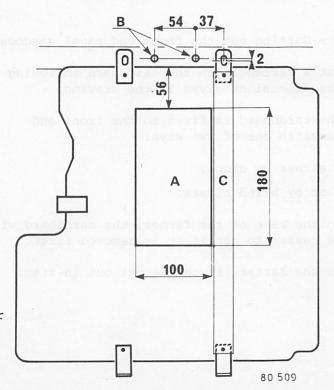
When the engine cooling radiator is inserted on the R.H. side, the oil cooler must be fitted to the L.H. side of the front end panel cardboard.

- Cut rectangle A out of the cardboard.

 The R.H. vertical side should be flush with the edge of stiffener (C).
- Drill 2 x 7 mm dia. holes (B) in the top crossmember at the distance given on the right.
- Remove stiffener (C).

b - Installing the oil cooler

The methods for fitting an oil cooling radiator on the R.H. or L.H. side of the engine cooling radiator are similar.



R. 1271



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FITTING HOSES AND PIPES

Remove:

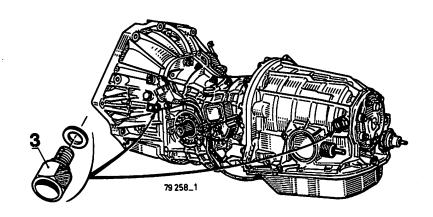
- engine undertray,
- and exhaust downpipe.

On the automatic transmission

Remove:

- oil return pipe between converter and casing (oil may run out, the quantity involved depending on how long the vehicle has been standing).
- and the 2 unions and seals.

Fit unions (3) with their new seals instead of the old unions and torque tighten them to 3 m.da N (22 1/2 lb/ft).



Pipe and hose connections

Connect:

- Pipe (4) to pipe (5),
- Pipe (6) to pipe (7).

Fit the clips temporarily without tightening to allow for lining up correctly later on.

Offer up the pipes to the vehicle.

Start the union threads on the following but do not tighten:

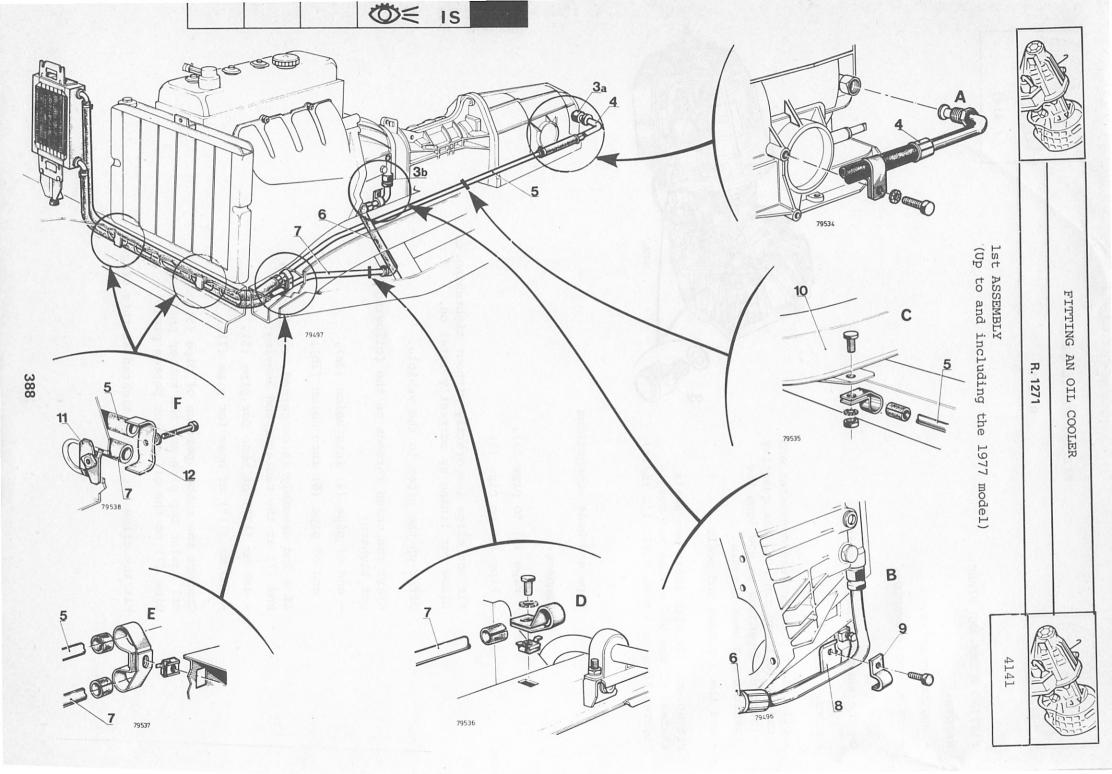
- end of pipe (4) into union (3a),
- end of pipe (6) into union (3b).

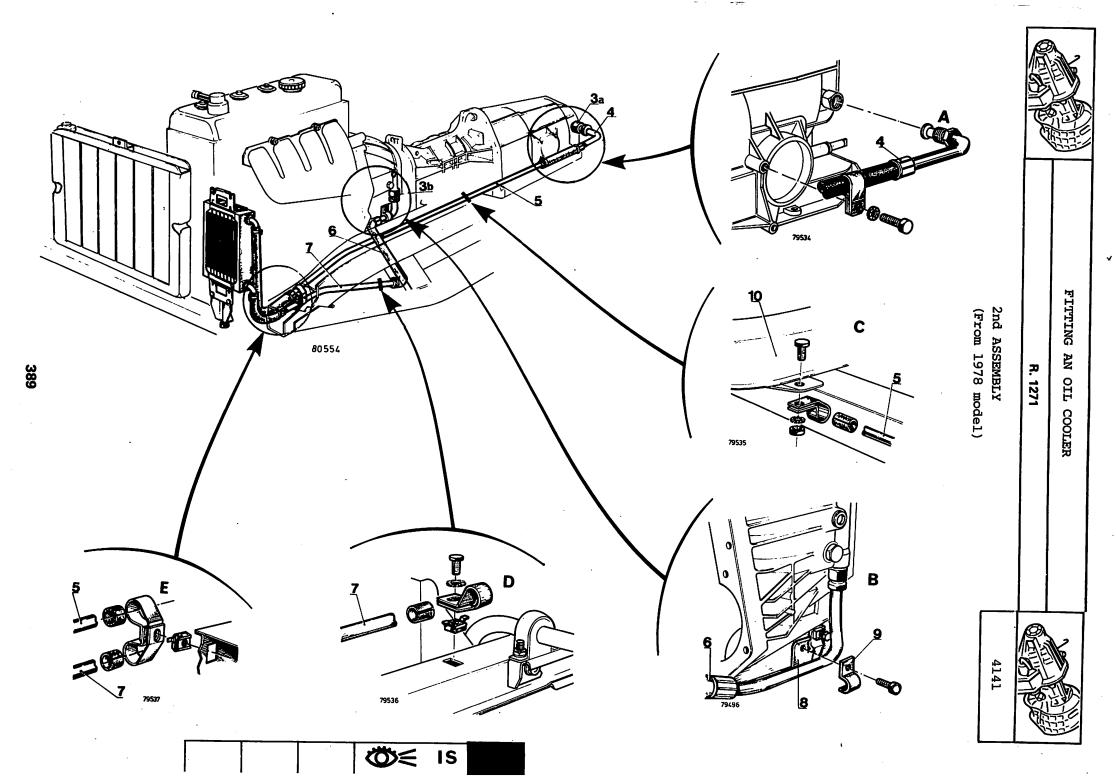
If a 2nd assembly is concerned, cut pipe (5) and (7) at the radiator end leaving:

- 430 mm (17") of hose for pipe (5),
- 280 mm (11") of hose for pipe (7).

Connect the rubber portion of pipe (5) to the oil cooler top pipe and the rubber portion of pipe (7) to the oil cooler bottom pipe.

Fit the clips but do not tighten at this stage.





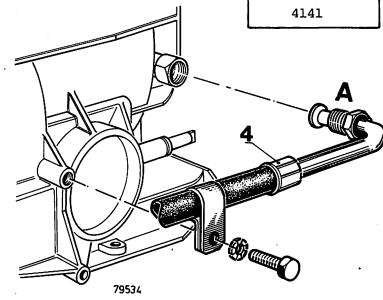
R. 1271



e - Pipe fixings

For pipe (4):

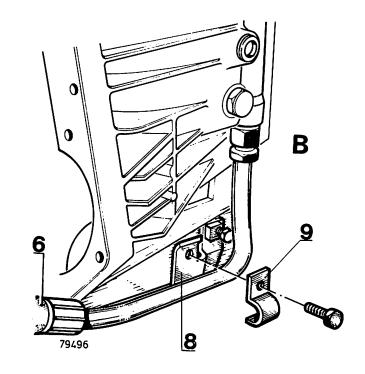
Secure as shown in sketch A.



For pipe (6):

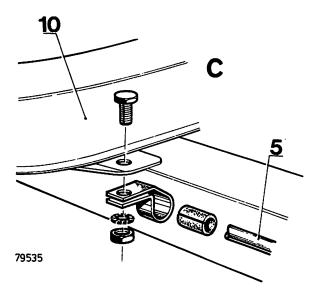
Sketch B: Screw lug (8) to the converter casing web.

Clamp the pipe with clip (9).



For pipe (5):

Sketch C: Drill an 8 mm dia. hole in the L.H. front end of the steering box crossmember (10) and secure pipe (5).



FITTING AN OIL COOLER

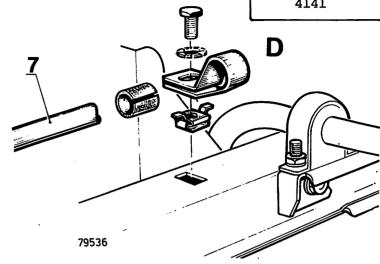
R. 1271



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For pipe (7):

Sketch D: Insert a cage nut into the existing hole in the L.H. lower sidemember and secure the pipe.



For pipes (5) and (7):

Sketch E: Insert a cage nut into the existing hole on the inside of the L.H. lower sidemember.

Use two sleeves to hold the pipes.

For rubber portions of pipe (5) and (7):

Sketch F: Insert nut support plates (11) into the apertures in the front end panel crossmember.

Secure the rubber hoses with clips (12).

Pmce all the pipes are fitted, tighten:

- all screw type clips,
- pipe ends (4) and (6) to 2 m.da N (15 lb/ft).

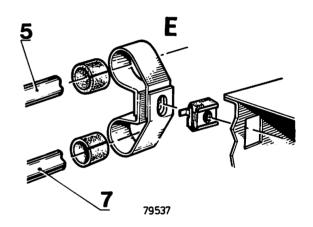
Refit:

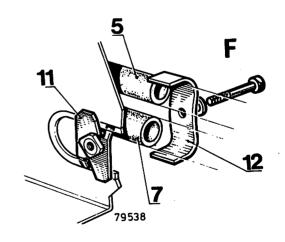
- exhaust downpipe,
- engine undertray.

Check and top up the automatic transmission oil level with engine running and selector lever in (P) Park.

Circuit oil capacity after fitting an oil cooler.

The circuit capacity is increased by 0,4 litre (3/4 Imp.pt.).







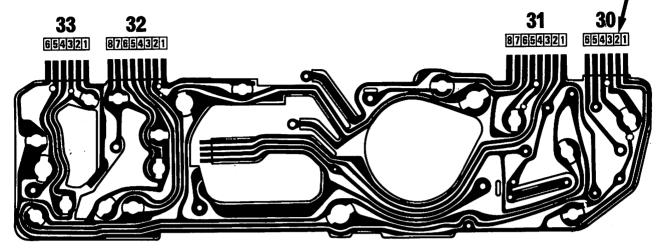
Code 9619

R.1271



THE PRINTED CIRCUIT FROM 1979 MODEL ONWARDS

4141



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The permissible weight that the Renault 30 TS Automatic may tow has been increased commencing with 1977 models.

It is advisable to fit an oil temperature warning light on the dashboard of this vehicle to enable a check to be made that the oil temperature does not exceed 135 °C when towing a caravan.

This fitment is also recommended for pre-1977 vehicles being driven in hot or mountainous countries and towing a caravan.

Details are given below of the parts required to fit the warning light and the method of assembly.

Description:	Part No.			
Sump	77	01	460	250
Sump gasket	77	00	632	285
Thermal switch	77	00	637	424
Thermal switch seal	79	03	062	001
Bulb holder	77	00	5 77	827

METHOD OF OPERATION

- Disconnect battery.
- Drain the automatic transmission mechanism casing.
- Remove sump,
- Fit the new sump with the thermal switch union
- Fit the thermal switch and seal.
- Refit mechanism casing with ELF Renaultmatic D2 or MOBIL ATF 220 oil.

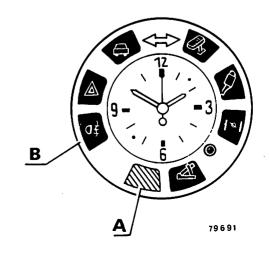
ELECTRICAL CONNECTIONS

1 - Instrument panel fitted with headlight
 main beams "On" warning light (B)

Use spare lens (A) and fit a bulb holder and 12V 1.2W bulb.

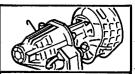
Connect a wire between the thermal switch and terminal (U) on the instrument panel multiple connector, routeing the wire through an existing grommet in the scuttle.

2 - Instrument panel fitted with headlight main beams "On" warning light on one side of the coolant temperature gauge and dipped beams "On" warning light on the other side.



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4141

Use spare lens (D).

There are three possibilities:

a - The instrument panel has no bulb in the spare position.

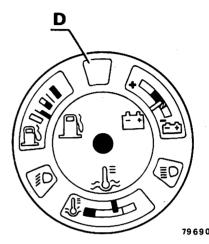
Fit a bulb holder and 12V 1.2W bulb behind spare lens (D).

Connect a wire between the thermal switch and terminal (B) on the multiple connector, routeing the wire through an existing grommet in the scuttle.

b - The instrument panel is fitted with a bulb.

Make the same connection as above.

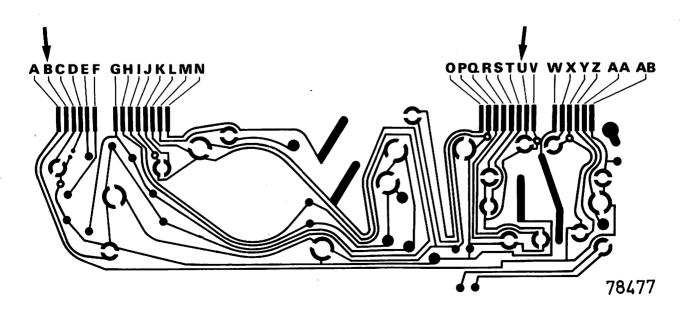
c - During 1977, vehicles in production will be fitted with a wire running from a switch on the instrument panel to a point in the engine compartment near the R.H. shock absorber mounting.



Connect this end to a wire running to the thermal switch.

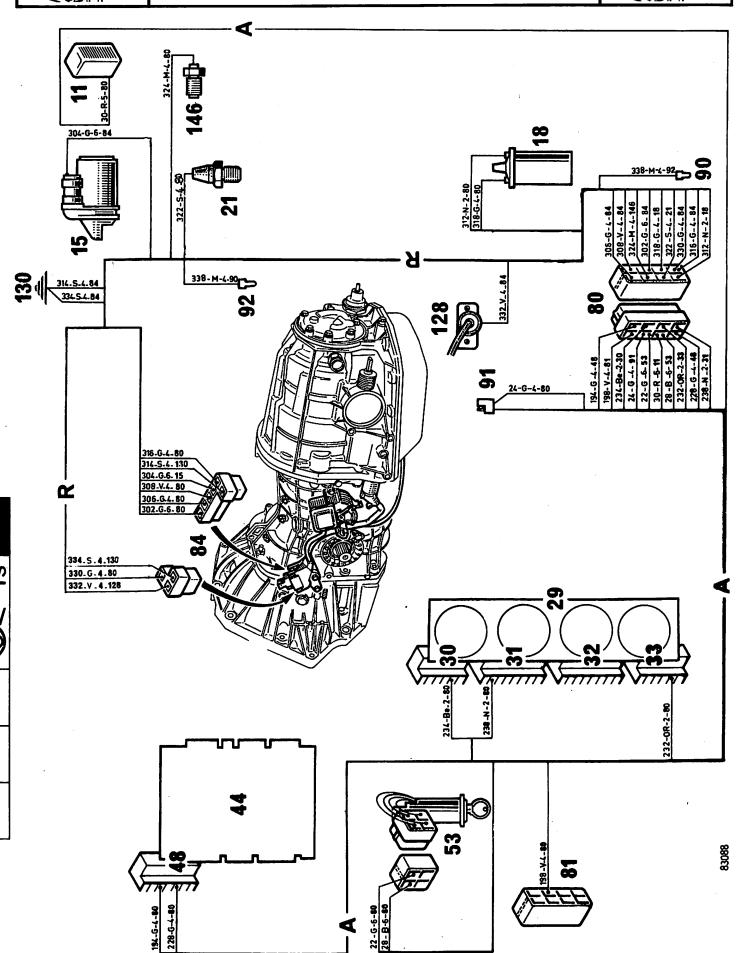
Reconnect the battery.

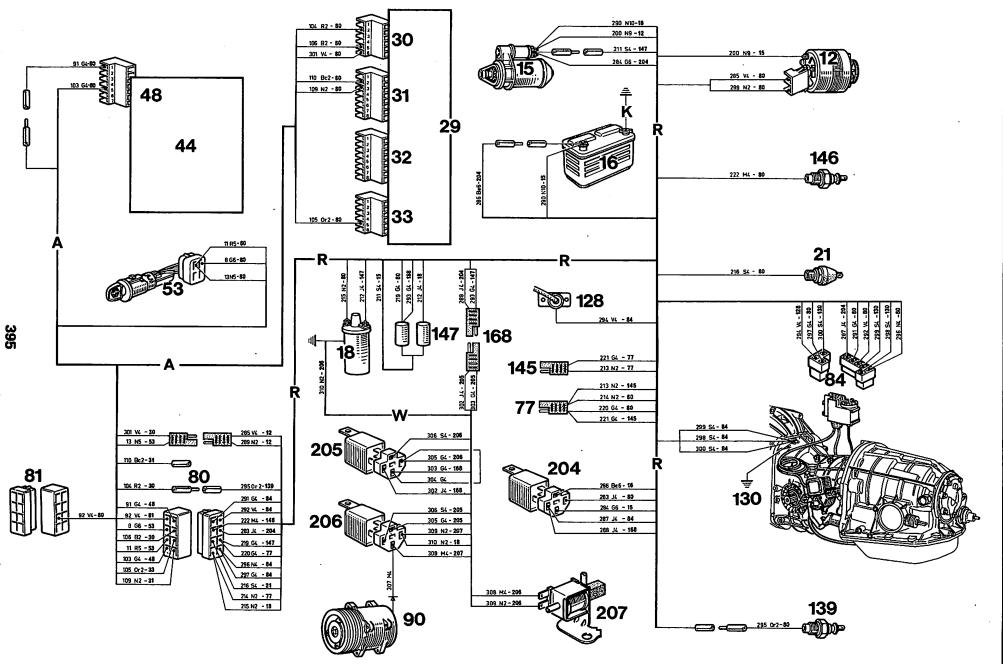
THE PRINTED CIRCUIT UP TO AND INCLUDING THE 1978 MODEL











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WIRING DIAGRAM



WIRING DIAGRAM





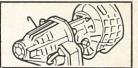
LIST OF HARNESSES

- A Engine front
- K Starter
- R Engine
- W Anti-stall

LIST OF UNITS

- ll Regulator
- 12 Alternator
- 15 Starter
- 16 Battery
- 18 Ignition coil
- 21 Oil pressure switch
- 29 Instrument panel
- 30 Connector No.1 instrument panel
- 31 Connector No.2 instrument panel
- 32 Connector No.3 instrument panel
- 33 Connector No.4 instrument panel
- 44 Accessories plate (fusebox)
- 48 Junction block front harness to accessories plate
- 53 Ignition-starter switch
- 77 Diagnostic socket junction
- 80 Junction block front harness to engine harness
- 81 Junction block front harness to rear harness
- 84 Junction block front harness to auto-transmission harness
- 90 Wire junction air conditioning electro-magnetic clutch
- 91 Wire junction brake pad wear warning light
- 92 Wire junction optional air conditioning
- 124 Automatic transmission
- 128 Kick-down switch
- 130 Automatic transmission earth
- 139 Automatic transmission oil temperature gauge thermal switch
- 145 Wire junction transistorized ignition
- 146 Thermal switch
- 147 Ignition coil resistance
- 168 Junction block engine harness to anti-stall harness
- 204 Starter relay
- 205 Main anti-stall relay
- 206 Anti-stall time switch relay
- 207 Anti-stall solenoid valve





connected to unit 146

S

WIRE IDENTIFICATION

Each wire is identified by a number followed by a letter(s) indicating the colour, a number indicating the wire diameter followed by the number of the unit to which the wire is connected.

Example:

Unit 146 on the right (thermal switch)

with wire: 222-M-4-80.

Wire colour (maroon)

Wire No.

222-M-4-80

Harness letter
(Engine)

At 2222-146

This wire is connected to unit 80

On Unit 80 (Junction block - front harness to engine harness), wire 222 appears again but marked 222-M-4-146 this time.

Wire colours:

Beige White Blue Clear Grey Yellow Black Pink Red Green Maroon Violet Orange Be Bc B C G J N S R V M Vi Or

Wire diameters:

No.	1	2	3	4	5	6	7	8	9
mm	7/10	9/10	10/10	12/10	16/10	20/10	7 25/10	30/10	45/10

Only special tools suitable for these particular automatic transmissions are mentioned in this chapter. Refer to MR.500 and the "Garage Equipment and Material" chapter for all other conventional garage equipment.

CLASSIFICATION OF SPECIAL TOOLING



SPECIAL "ESSENTIAL" TOOLING

ESSENTIAL TOOLS, marked by an (X) in the "Classification" column are those necessary for carrying out Quality repairs on one or more models of our Make.



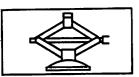
SPECIAL "USEFUL" TOOLING

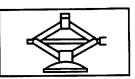
Tools marked by a (U) in the "Classification" column are USEFUL TOOLS.

They assist operations and save time.

MATERIAL

From now on workshop materials and special products for our vehicles are listed in the I.S. Notes for MR.171 or O.C.P.R. information sheets.





Methods	Part No.		DESCRIPTION
Mot.50	00 00 987 700	X	Torque wrench - range O to 25 m.da N - with ½" sq. drive
Mot.582	00 00 058 200	X	Locking sector for converter
Mot.593	00 00 059 300	X	Engine-auto-transmission drain plug wrench
Mot.597	00 00 059 700	X	Engine-auto-transmission lifting hook assembly
			AUTOMATIC TRANSMISSION ————————————————————————————————————
B.Vi.16-01	00 01 336 601	U	Transmission support for fitting to DESVIL stand
B.Vi.28-01	00 01 227 301	X	Bearing extractor with jaws 146 mm long
B.Vi.31-01	00 01 259 401	X	Set of 3 drifts for 5 mm dia. rollpins
B.Vi.39	00 01 322 500	X	Drift for 4 and 10 mm dia. rollpins
B.Vi.48	00 01 330 300	X	Short jaws for extractor B.Vi.28-01
B.Vi.315	00 00 031 500	X	Selector control ball joint wrench
B.Vi.377	00 00 037 700	X	Differential ring nut castellated wrench
B.Vi.455	00 00 045 500	U	Automatic transmission lifting hook
B.V1.465	00 00 046 500	X	Converter oil seal inserting tool
B.Vi.466-04	00 00 046 604	U	Automatic transmission oil pressure testing gauge
B.Vi.489-19	00 00 048 919	Х	Set of special tools for automatic transmission overhaul
B.Vi.524-01	00 00 052 401	X	Automatic transmission oil temperature sensor
			(use with B.Vi.454-06 or 797-01)
B.Vi.536	00 00 053 600	X	Vacuum capsule screwdriver
B.Vi.553	00 00 055 300	U	Differential ring nut changing sleeve
B.Vi.564	00 00 056 400	X	Brake locating mandrel
B.Vi.606	00 00 060 600	X	Set of 3 drifts for 6 mm dia. rollpins
B.Vi.645	00 00 064 500		Differential ring nut castellated wrench
B.Vi.656	00 00 065 600	X	4141 auto-transmission selector tool
B.Vi.664	00 00 066 400		Adaptor for control box B.Vi.454-06 or B.Vi.797
B.Vi.667	00 00 066 700		Vacuum capsule wrench
B.Vi.710	00 00 071 000	X .	Set of special tools for 4141 auto-transmission overhaul
B.Vi.797-01	00 00 079 701		Automatic transmission control box
B.Vi.805	00 00 080 500		Differential ring nut castellated wrench (use with B.Vi.654)
B.Vi.806 B.Vi.807	00 00 080 600		Final drive pinion locking tool
B.V1.807 B.V1.813	00 00 080 700		Differential ring nut castellated wrench
B. VI. 013	00 00 081 300	X	Differential ring nut oil seal protector
			FRONT AXLE
	00.00.047.055		
T.Av.476	00 00 047 600		Ball joint extractor
T.Av.509-01	00 00 050 901	X	Set of 2 spacer legs to hold front axle compressed
T.Av.603	00 00 060 300	X	Set of 2 spacer legs to hold front axle compressed
		· · · · · ·	STEERING
Dir.21-01	00 01 215 301	×	Steering wheel extractor
	00 01 210 001	^	preering wheel extractor
B '	<u></u>		



